LITERATURE OF MANUFACTURERS

Catalogues, bulletins and other direct advertising material recently issued.

Manufacturers are requested to send copies of new trade literature promptly to Electric Refrigeration News.

Kerotest

The Kerotest Manufacturing Co., Pittsburgh, Pa., is placing in the mails its catalog showing the 1930 line of Kerotest forged brass valves and fittings for mechanical refrigeration.

Products illustrated in the catalog include: bellows packless angle valve with back seat, angle valve with packing and metal to metal back seat, 3-way manifold valve of bellows packless type, 3-way manifold valve with packing and metal to metal back seat, bellows packless 3-way valve with back seat, single shut-off angle valve, single shut-off 3-way valve, single shut-off evaporator valve, double shut-off valve with seal cap, double shut-off commercial valve, 3-way or 4-way double shut-off commercial valve, double shut-off line valve with exposed stem, central charging tank valve, single shut-off line or evaporator valve.

Miscellaneous parts are wing nut seal caps, manifold clamps, handwheels, fusible safety plugs. Manifold assemblies are also described. A complete line of S. A. E. flare tube fittings is also shown in the catalog.

KitchenAid

Four attractive folders are included in a series being distributed to housewives by the KitchenAid Manufacturing Co., Troy, Ohio. These pieces are done in colors and have a direct appeal to women who wish to make their work easier in the preparation of foods.

Koch

A "sweat-proof" display counter with refrigerated base is announced in a broadside issued by the Koch Butchers' Supply Co., of North Kansas City, Mo. Refrigeration coils are placed at the top of this counter to provide proper air circulation. Heavy corkboard insulation is used throughout and the front is of three panes of ¼-inch plate glass set in rubber.

NEW JERSEY DEALERS OPEN NEW DISPLAY ROOMS

Ocean City, N. J.—A new sales and display room was opened on Saturday, February 22, by the T. S. Goslin Lumber Company of Ocean City, and Wildwood. Invitations to the opening were sent out, and those who attended partook of frozen desserts served by a Frigidaire hostess. The 1930 Frigidaire line was on display. The new showroom is at 824 Asbury Avenue, Ocean City.

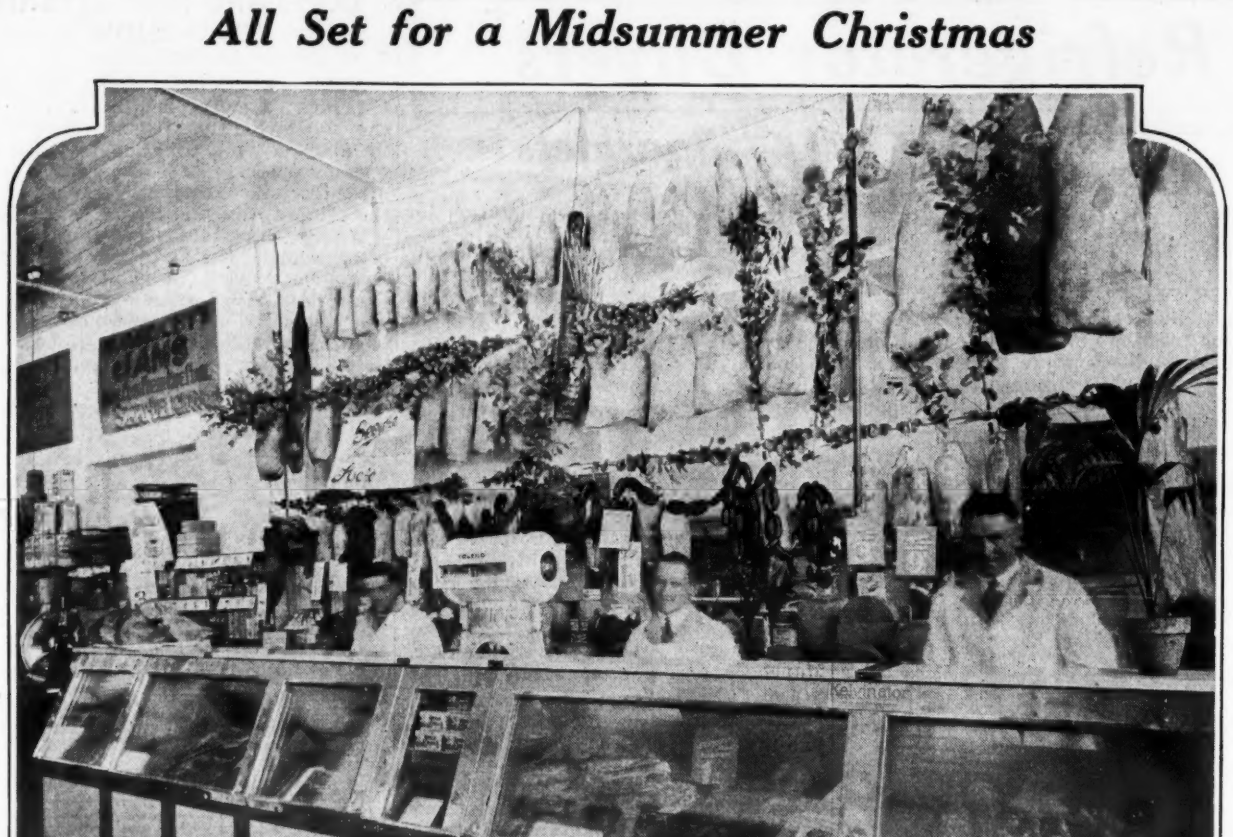
COPELAND ORGANIZES TWO NEW DEPARTMENTS

Mt. Clemens, Mich.—Louis Ruthenburg, president Copeland Products, Inc., announces the creation of a new factory department, that of purchasing and stock control, with C. H. Kramer and O. G. Lonskey, both long-time factory officials, as director and assistant, respectively. The new department supersedes the old purchasing and materials departments.

WANTS NEWS MORE OFTEN

"I hope that you will decide very shortly to issue your magazine every week, as it seems to the writer that the industry is progressing to such an extent, and your paper is doing such excellent work, and if we could get the news more often it would help us enormously."—M. George Tigar, Tigar Corporation, Chelsea, Mass.

All Set for a Midsummer Christmas



Adelaide, South Australia—Mechanical Supplies, Limited, Kelvinator distributors for Adelaide, have made remarkable progress in their commercial drive in Adelaide's busiest shopping centre. Five large commercial installations were booked in the opening of the summer and completed before the Christmas holiday period. The purchasers include Messrs. Charlick Bros., Limited, and Messrs. S. O. Beilby, Limited, both big grocers, who are operating 18-foot display counters. Cash & Carry, Limited, Cafeteria, are enthusiastic about their storage box and short order cabinet installed in their pantry. Balfour Wauchope, Ltd., have Kelvinator multiple units for cooling soda fountain beverages. Stone's Central Delicatessen Store also has a large glass front display counter refrigerated by Kelvinator. The attractiveness of the equipment has elicited much favorable comment.

The photograph shows one of the installations, a display counter fitted in Messrs. S. O. Beilby, Ltd., Serv-Self Grocery for the produce department. Designed, constructed and Kelvinated in the engineering worshops of Mechanical Supplies, Limited, it is efficient in design and craftsmanship and includes many improvements over previous models. This display counter is 18 feet long by 4 feet high and 3 feet deep at base, has a counter for a Toledo scale and wrapping situated at the rear, with quick opening hardware on the doors to take care of brisk trade. The front is fitted in twin glass, trimmed in Monel metal and nickel. The lower section is used for bulk storage for its entire length. It is framed in mahogany and paneled with vitrolite slabs.

The display case is refrigerated throughout on a multiple hook-up by a central condensing unit with Kelvinator cross finned coils. Low temperature coils provide for the fish compartment, and one other division is set aside for butter, etc. The orange drink cooler also is operated by the Kelvinator unit.

Wm. Queale, managing director of Mechanical Supplies, Ltd., attributes their success in electric refrigeration to sound selling methods, and in a great measure to complete mechanical and woodworking shops, which enable them to quote special cabinets and boxes from their own designs.

"When you have a personal interest in every 'nut and bolt' in the plant such as V. Barnden, manager of Kelvinator division, and myself have," said Mr. Queale, "it makes a long step forward towards better workmanship and prompt delivery to the customer."

REQUESTS FOR INFORMATION

Readers who can assist in furnishing correct answers to inquiries, or who can supply additional information, are invited to address Electric Refrigeration News, referring to the query number.

Glass Defrosting Trays

Query No. 356—"We have a customer who wants glass defrosting trays, and we have never furnished them and are at a loss to know where they can be bought. The size we want is about 9½" wide, 13½" to 14" deep and 1¾" high."

Note—The Corning Glass Company, Corning, N. Y. and the McKee Glass Company, Jeanette, Pa., make glass containers suitable for use as defrosting trays.

Changing Over Compressors

Query No. 357—"Kindly advise if a Frigidaire (sulphur dioxide) coil can be used with a Copeland compressor if this compressor is discharged of all isobutane and charged with sulphur dioxide. In other words, is the clearance in this machine such that it can be operated with sulphur dioxide?

"Advise also if ethyl and methyl chloride compressors can be operated with sulphur dioxide without changing the clearances?

Does Servel use ethyl or methyl chloride?

"Is there a book published on different refrigerants used in small automatic machines, discussing pressures, temperatures, moisture, etc.?"

Note—It is possible to operate isobutane, ethyl and methyl chloride compressors with sulphur dioxide without changing clearances. However, manufacturers do not recommend the changing over of equipment, due to the operating characteristics of this and that make of machine. Pressures vary in machines using different kinds of refrigerants. In changing over a methyl chloride or iso-butane compressor some of the operating efficiency is lost. The machine will not furnish the same capacity with sulphur dioxide as with methyl chloride or iso-butane.

Servel uses methyl chloride.

"Household Refrigeration" (Third Edition, Revised and Enlarged) Price $3.50, by H. B. Hull, and "Principles of Mechanical Refrigeration" (1928) Price $3.00, by H. J. MacIntire, both devote considerable space to discussions of refrigerants. You can obtain copies of these books by sending order and remittance to Electric Refrigeration News.—Editor.

BRUNSWICK-KROESCHELL OPENS BRANCH

Philadelphia, Pa.—A short time ago the Brunswick-Kroeschell Co., New Brunswick, N. J., opened an office here at 675 North Twelfth St., under the management of L. M. Church.

The territory and premises of the Goetz Ice Machine Company have been taken over, and Victor J. Goetz is associated with the Philadelphia office as special representative. H. C. Bartholomew is sales engineer.

INCREASES SALES STAFF

Shreveport, La.—The sales force of the Automatic Refrigeration Company, of Shreveport, distributors of Frigidaires, has been increased to twenty salesmen, preparatory to the opening of the sales season, according to announcement of M. R. Harrelson, sales manager. A sales school, under the direction of factory representatives, was held at the Washington-Youree Hotel in the early part of February for the entire force. There are fourteen new salesmen in the organization this season.

SERVEL SPEEDS OUTPUT TO MEET HEAVY DEMAND

Evansville, Ind.—Announcement is made by Servel, Inc., that the Servel plant is now operating at 100% capacity in all departments. Overtime work in some divisions, notably the automobile truck body plants, has been necessary because of heavier sales than anticipated.

In the refrigeration division, large orders for present and future delivery of both the Servel electric and the Electrolux gas refrigerators make it necessary to build up a reserve supply to meet heavy demands of dealers and distributors in this country and abroad. Seasonal activities in refrigeration will soon reach their height, and dealers are placing orders now for late spring and early summer delivery.

For instance, the Philadelphia (Pennsylvania) Electric Company placed an order last Saturday for 750 Servel electric refrigerators and from the Consolidated Gas Company, New York, one for 1068 Electrolux refrigerators. This latter order is for the largest apartment building ever designed—the London Terrace, New York.

KETTERING SPEAKS TO FLORIDA MEN

Miami, Fla.—F. H. McDonald, Frigidaire distributor for southeastern Florida and the Bahamas, held a banquet, Feb. 17, for the various Frigidaire dealers and salesmen and service men in the community. The banquet was held at the beautiful Coral Gables Country Club. Charles F. Kettering, vice-president of the General Motors Corporation, and president of the General Motors Research Corporation, was the guest of honor. Other speakers were R. B. Burdine, president of Burdine's, Miami, one of the largest department stores south of Washington; J. H. Gill, president of the Florida Power & Light Company, and C. R. Preston, director, merchandise sales department, Florida Power & Light Company.

DEHYDRATED TUBING FOR QUICK USE
Made to A. S. T. M. Specifications (B 68-27T)
Shipped Rush from Stock
WOLVERINE TUBE CO.
1431 Central Ave. Detroit, Mich.

THE CONDENSER

ADVERTISING RATE fifty cents per line (this column only).

SPECIAL RATE if paid in advance — Positions Wanted — fifty words or less, one insertion $2.00, additional words four cents each. Three insertions $5.00, additional words ten cents each. All other classifications—fifty words or less, one insertion $3.00, additional words six cents each. Three insertions $8.00, additional words sixteen cents each.

POSITIONS AVAILABLE

LARGE distributing organization handling distribution in three states desires sales director thoroughly experienced in marketing electric refrigeration. Only men with proved capabilities and background of results will be considered for this unusual opportunity. Full qualifications and salary expected should be stated in first letter which will be held in strict confidence. Address Box 239.

EXPERIENCED salesmen to sell Kelvinators in electrical refrigeration division of public utility company's merchandise sales organization. 12½ per cent commission. Apply to Merchandise Sales Dept., Metropolitan Edison Company, 412 Washington Street, Reading, Pa.

PUBLIC Utility has opening for several experienced men capable of supervising groups of salesmen in its merchandise sales organization. Salary and commission. Apply to Merchandise Sales Dept., Metropolitan Edison Company, 412 Washington Street, Reading, Pa.

POSITIONS WANTED

SALES Executive—Very broad experience national and foreign sales in electric refrigeration. Has large volume foreign business at hand and number of large distributors and dealers in the United States. Want connection with substantial manufacturer having well-built electric refrigeration units. Will take full responsibility for foreign or national sales, or both, on equitable commission or salary arrangement.

Response from chief executive invited, and will be held in confidence. Address Box 236.

REFRIGERATION Service Engineer. Eight years' experience in domestic and commercial refrigeration. Can organize and train service department in all types of installations. Prefer Copeland. Also well informed on oil and coal burning equipment. Box 238.

MISCELLANEOUS

FOR SALE—Large stock of Servel S7 refrigerators far below cost. Good opportunity for profit. All in original crates. Box 230.

TO MANUFACTURERS OF ELECTRIC AND GAS UNITS
If you want CABINETS as you want them let PUFFER-HUBBARD build them. We work to specification.
Puffer-Hubbard Mfg. Co.
MINNEAPOLIS, MINN.

REFRIGERATOR LINE FITTINGS
"UNITED" Copper Tube
dehydrated-deoxidized
Quick Service For New England
A. E. BORDEN CO.
110 High St., Boston, Mass.

GET TEST FACTS
and get the *essential* facts accurately!
Experience only, teaches whether you are trying to measure a city block with unnecessary micrometric precision, while completely missing essential basic facts.
You are welcome to visit our laboratory at any time.
GEORGE B. BRIGHT CO.
Refrigerating Engineers & Architects
2615 12th St., Detroit

DRINKING WATER FAUCETS
for
Refrigerators — Water Coolers
New model now available for use on city water pressure

CORDLEY & HAYES
147 Hudson Street New York City

Subscription Order

ELECTRIC REFRIGERATION NEWS
550 MACCABEES BUILDING, DETROIT, MICH.

Please enter subscription to Electric Refrigeration News.

United States and Possessions:
☐ $2.00 per year. ☐ Three years for $5.00

All other Countries:
☐ $2.25 per year. ☐ Two years for $4.00

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Street Address_____

City and State_____

Remarks:_____

ELECTRIC REFRIGERATION NEWS

Registered U. S. Patent Office.

The business newspaper of the refrigeration industry

ISSUED EVERY TWO WEEKS
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TWO DOLLARS PER YEAR

SERVICE MANAGERS DISCUSS THEIR WORK AT DETROIT MEETING

A. S. R. E. Members Hear Experts Tell How They Do It

Detroit, Mich.—Service problems in all their various ramifications were discussed by the Detroit Section of the American Society of Refrigerating Engineers at a meeting held in the Masonic Temple on the evening of Monday, March 17. The meeting, which was preceded by a dinner, was attended by about seventy persons, an unusually large number for a sectional meeting.

Edward Barger, formerly in charge of service for Copeland, and still with the Copeland organization but engaged in other work, was chairman and led the discussion which followed the remarks of the different speakers. First on the program was A. D. McLay, of the Detroit Edison Company, who presented some of the customer's reactions and described the service work that his company does, pointing out that the power companies have an investment in each refrigerator sold and are vitally interested in seeing that it is kept running.

H. L. Spencer, national service manager for Norge, followed and told of the set-up which takes care of service on Norge machines. He advocated a close relationship between the factory and service, and described the steps he has taken to promote such a relationship in his organization. Complaints from the field are thoroughly discussed and considered at joint meetings of factory and service executives.

N. K. Baxter, who will have charge of Westinghouse service work, talked briefly of the plans which his company is making, but which are still in a formative stage. Methods are being worked out for doing much of the service work at the factory, the unit being removed from the cabinet and shipped back to Mansfield, being replaced meanwhile by another unit. The Westinghouse design makes this transfer possible at a minimum of trouble and expense. Many of the details have not yet been worked out because of the short time that Westinghouse has been in the field, but in spite of the necessarily indefinite nature of Mr. Baxter's remarks they were followed with the keenest interest. When he had concluded, Mr. Barger, in thanking him, remarked upon the fact that many men in Mr. Baxter's position, with a new product on their hands, would have been unwilling to make any statements whatsoever.

The best picture of a service man's job that has found its way into public view in a long time, was then presented by George L. Sutphen, manager of the service and installation department of

(*Continued on Page 2, Column 4*)

WESTINGHOUSE SHIPPING TO NEARBY DISTRIBUTORS

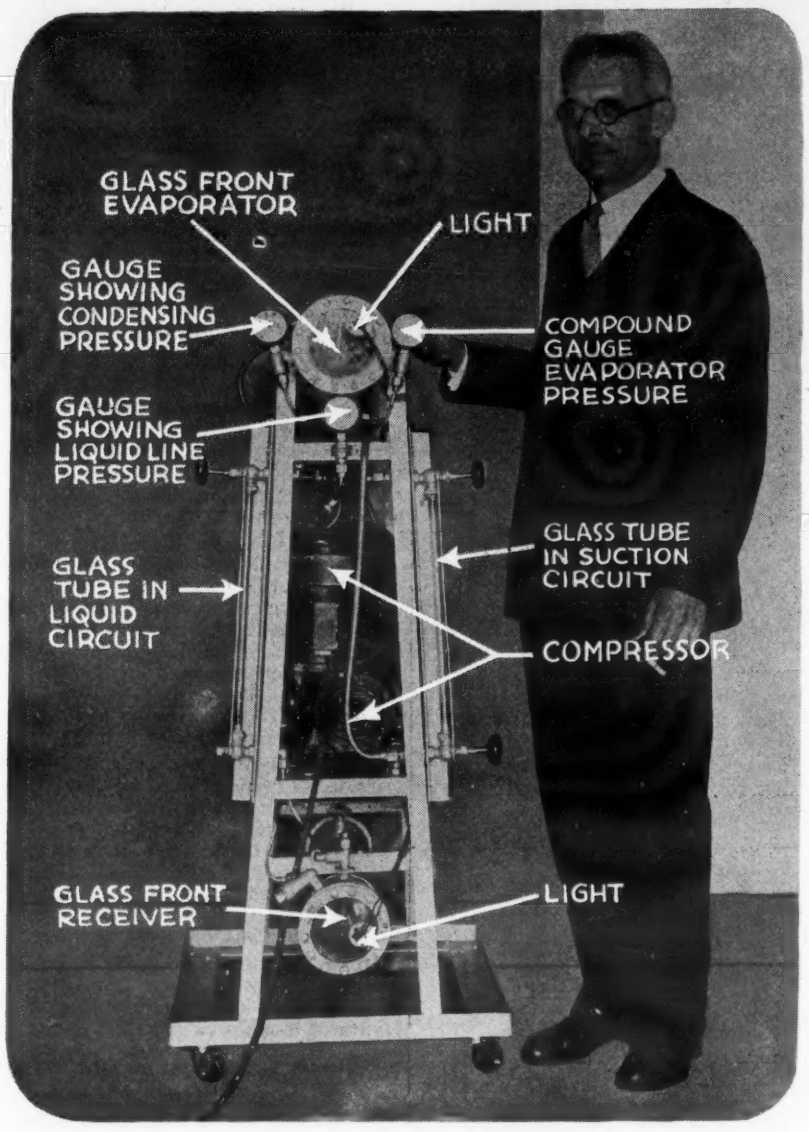
Mansfield, Ohio—Stock shipments of the new Westinghouse electric refrigerator were made to distributors the first week in March. The factory will soon be in full swing on quantity production. By the last of this month the output will be 100 units per day. Present distribution is being limited strictly to outlets in Michigan, Ohio and Pennsylvania. The number of distributing centers will be gradually increased as the year progresses, but under no circumstances will the total output for 1930 exceed 25,000 units, says Carl D. Taylor, general manager of the Refrigeration Department.

Metropolitan distributors already appointed include the Good Housekeeping Shop in Detroit, Sloman & McKinnon, Cleveland, and Whitehall & Danforth, Pittsburgh.

General distributors are the Moock Electric Supply Company, in Canton, O.; American Radio Distributing Co., Columbus, O., and the Tafel-Williams Corp., Cincinnati and Louisville. These distributors will operate their own retail departments.

Reports from dealers indicate that a surprisingly large number of orders for the new Westinghouse unit have already been booked, many of the orders being placed before the dealers were able to show sample units. Inquiries regarding dealerships continue to flood the Mansfield headquarters of the Refrigeration Department, in spite of announcements that the first year's production would be placed entirely in the territory close to the factory.

Letting in the Light



THE ingenious machine shown above was made by A. F. Dietz, of the National Dairy Company, who is standing beside it. As the arrows show, the use of glass ports at strategic points makes it possible to see just how an electric refrigerator works. The progress of the refrigerant through the refrigerating cycle can be plainly seen. The machine is equipped with valves and by-passes which make it possible to create any desired operating conditions, normal or otherwise.

Mr. Dietz constructed his machine for the purpose of using it to instruct service men. It is proving an excellent tool for that sort of work, as it gives the service man a chance to see what happens inside a refrigerator, a sight that has been denied him heretofore.

HOME SERVICE WORKERS MEET IN KELVIN KITCHEN

Detroit, Mich.—The first Kelvinator refrigeration course for home service departments, held in the Kelvin Kitchen at the factory, proved intensely interesting and instructive. The majority of the home service directors who took the week's course were from companies distributing Kelvinator in the United States and Canada.

These young women were all alert, keen and ambitious to know all there is to know about the Kelvinator and the part it plays in their home economics work. As one member of the class remarked, "We certainly are finding out things at the Kelvinator factory that it would be impossible to discover at our home establishments. Here we get the whole picture of electric refrigeration. Here we listen to addresses by experts, who give us an insight that equips us to carry on at home with very much increased efficiency."

The story of the nature of the course is best told by the well filled program, which was adhered to without variation.

The course opened Monday, March 10, at 11:00 a. m., with an address of welcome by Mary E. Kirk, director of the Kelvinator home economics department. Monday afternoon was devoted to an address, "History of Refrigeration," by Earl Lines, director of advertising. This was followed by Marion F. Sawyer, Kelvinator home economist, talking on "Reasons for Refrigeration."

Tuesday's program was opened with an address on "Principles of Refrigeration," by Vance C. Woodcox, sales promotion manager. Sales Manager Sayre's subject was "Kelvinator, the First and Greatest." C. C. Thomas, design engineer, talked in the afternoon on "Cabinet Construction."

Wednesday morning John Wyllie, Jr., commercial laboratory engineer, discussed "Mechanics of Refrigeration." This was carried over into the afternoon. Immediately after lunch the class was escorted through the factory by Jack Cunningham, of the factory executive department. After returning from this interesting jaunt, Mr. Wyllie finished his discussion and was followed by Miss Sawyer, who addressed the delegates on "Efficiency." She also talked on care and proper placement of food in the Kelvinator.

Thursday's program was made interesting by an address on "Selling Kelvinator," by Howard Barber, general sales manager, Detroit branch. Miss Sawyer and Miss Kirk talked on the subject of "Servicing Installations by the Home Service Department Women," and they also conducted a discussion of

(*Concluded on Page 8, Column 1*)

Refrigerated Food

THIS issue of ELECTRIC REFRIGERATION NEWS is in two sections. The second section contains material on Refrigerated Foods, emphasizing the quick-frozen foods which are being talked of so much at present.

The story of the sales tests being made in Sprinfield, Mass., is covered in detail; display cases offered by manufacturers for quick-frozen foods are illustrated and described; Clarence Birdseye writes one of the leading articles; and other valuable information on the subject is presented.

The Refrigerated Food section will be continued and early issues will include a description of the Kolbe process, and an article by Dr. Harden F. Taylor, of the Atlantic Coast Fisheries. There also will be more data in regard to the latest equipment for handling quick-frozen food.

BANNER YEAR REPORTED IN G. E. 1929 STATEMENT

Schenectady, N. Y.—The year 1929 was the best in the history of the General Electric Company in volume of orders received, shipments billed, total profits and earnings per share of common stock.

Orders received during 1929 increased 28 per cent over 1928, sales billed increased 23 per cent, net income from sales increased 24.5 per cent, and earnings per share of common stock increased 25 per cent, the annual report, released by Gerard Swope, president, disclosed.

Profit available for dividends amounted to $67,289,880, equivalent, after dividends on the special stock, to $8.97 a share on the 7,211,481 shares of no par value common stock, compared with $54,153,806, or $7.15 a share, for 1928.

Orders received during 1929 amounted to $445,802,519, compared with $348,848,512 in 1928, an increase of 28 per cent, and unfilled orders at the end of the year totalled $94,623,000, compared with $72,953,000 at the close of 1928, an increase of 30 per cent. Sales billed for 1929 were $415,338,094, compared with $337,189,422 in 1928, an increase of 23 per cent.

Net income from sales in 1929 amounted to $49,395,896, which, compared with $39,661,230 in 1928, shows an increase of 24.5 per cent.

NEW REFRIGERATION CODE ADOPTED BY WASHINGTON

Washington, D. C.—A refrigeration code for the City of Washington was adopted on March 13, by the Commissioners of the District of Columbia. It is printed in full, beginning on page 16 of this issue of the NEWS. The new code has been under discussion for some time, and reports of its progress toward adoption have been printed in previous issues. At a hearing held on February 10 by Col. William B. Ladue and Procter L. Dougherty, members of the Board of Commissioners of the District, and A. R. McGonegal, inspector of plumbing, the refrigeration industry was well represented, and the refrigeration men attacked a number of the provisions of the code as then proposed.

A review of the code as adopted shows that most of the sections to which objections were made at the hearing remain unchanged. For example, there was considerable opposition to the provisions for annual inspection, but those provisions are still there. The requirement of secondary gas tight systems when multiple units are installed was attacked at the hearing, and was the subject of much discussion, but nevertheless it remains in the code.

The refrigerator men won a victory in their objection to the inclusion of methyl chloride in the list of irritant refrigerants. As adopted the code does not include methyl chloride in its table of irritants.

Under the provisions of the code, do-

(*Continued on Page 16. Column 1*)

CHEMISTS TO HEAR STORY OF NEW REFRIGERANTS

Atlanta, Ga.—A new development in the field of refrigeration is promised when the Division of Industrial and Engineering Chemistry of the American Chemical Society meets here April 7-10. Thomas Midgley, Jr., well known for his pioneer work on lead tetra ethyl, now commonly used in ethyl gas, will demonstrate a new class of refrigerating agents, organic substances containing fluorine.

The tentative program of the meeting calls for the presentation of this paper at the Tuesday morning (April 8) session. Mr. Midgley, consultant, General Motors Corp., and Albert L. Henne, consultant, Frigidaire Corp., are co-authors of this paper, which is entitled, "Organic Fluorides as Refrigerants."

"Some of these organic substances," according to an advanced statement by the American Chemical Society, "are surprisingly non-toxic. CCl_2F_2 is less toxic than carbon dioxide, as non-inflammable as carbon tetra-chloride, and very satisfactory from every other standpoint. Its toxicity has been studied by the United States Bureau of Mines, and the results will be included.

E. S. MATTHEWS IS CHOSEN ELECTRO-KOLD PRESIDENT

Spokane, Wash.—E. S. Matthews, formerly vice-president and sales manager of the Electro-Kold Corp. here, has been elected president of the company, succeeding Dr. X. L. Anthony, who died last fall. Mr. Matthews has been with the company as vice-president and sales manager since production was started on Electro-Kold in 1923.

Other officers and trustees of the company are unchanged. They are: H. L. Masterson, vice-president and general manager; L. M. Simpson, vice-president; Lloyd E. Gandy, secretary and treasurer, and D. W. Mather, assistant secretary and treasurer. Trustees are: John McKinley, L. M. Simpson, Lloyd E. Gandy, Edwin S. Matthews and H. L. Masterson.

CHICAGO COMPANIES HIT BY CODE TRUCE OF NEMA MEMBERS

Kegel Agrees to Rules Proposed By National Organization

Chicago, Ill.—Hostilities in the Chicago sector were renewed March 14 after a lull of several weeks, when the Health Committee of the Chicago City Council held another meeting in the extended series of open hearings on proposed regulations governing installation of refrigerating systems.

Rumors having gone forth that a compromise agreement had been reached by the opposing forces, and that the session would be uneventful, a number of familiar faces were absent from the arena. The atmosphere lacked the tension so noticeable at previous sessions. The proceedings started late and listlessly in one of the committee rooms of the City Hall, but the air soon became oppressive and the lone electric fan made so much racket that an adjournment was taken to the council chamber.

Dr. Arnold H. Kegel, Commissioner of Health, briefly reviewed the situation and outlined the aims of the Health Department in proposing an ordinance which would set up the principles of safety. He referred to a revised refrigeration code which had been agreed to by the leading manufacturers of small units on the previous day, which, he said, incorporated the principles set up by the Health Department and would therefore be acceptable with few, if any changes. He urged that the Council Committee take action without further delay in order to clarify the local situation, and also because other cities were watching developments in Chicago and waiting for a decision as a guide to pending legislation. He introduced two visitors. Captain A. R. McGonegal, Plumbing Inspector of the District of Columbia, Washington, D. C., and P. J. Zisch, president of the National Association of Coroners and coroner of Milwaukee, Wis., to confirm his statements.

The Captain and the Coroner

That Captain McGonegal and Coroner Zisch were present as guests, and the fact that they both expressed great respect for the leadership of Chicago in its study of the refrigeration safety problem, meant nothing to the argumentative aldermen. Quickly they launched upon a cross examination of the witnesses, and the affair soon took on the aspect of a murder trial. Late arrivals might easily have inferred that the Captain and the Coroner had been caught throwing an unauthorized brand of "pineapples" within the loop.

Alderman Eaton, who was chairman of the sub-committee which held the initial series of hearings last summer, called his fellow legislators to task for

(*Concluded on Page 21, Column 2*)

NORGE'S LATEST MODEL HAS COLD ACCELERATOR

Detroit, Mich.—The latest device of interest in the refrigeration field is the new electric refrigerator that is being placed on the market this month by the Norge Corporation of Detroit, subsidiary of Borg-Warner Corporation.

This new Norge refrigerator can be shipped directly from the factory and may be installed and ready for operation by simply plugging into a light socket. The freezer, connecting tubing and condensing unit may easily be installed or removed without moving the cabinet. Tube openings in the back of the cabinet are unnecessary in this device.

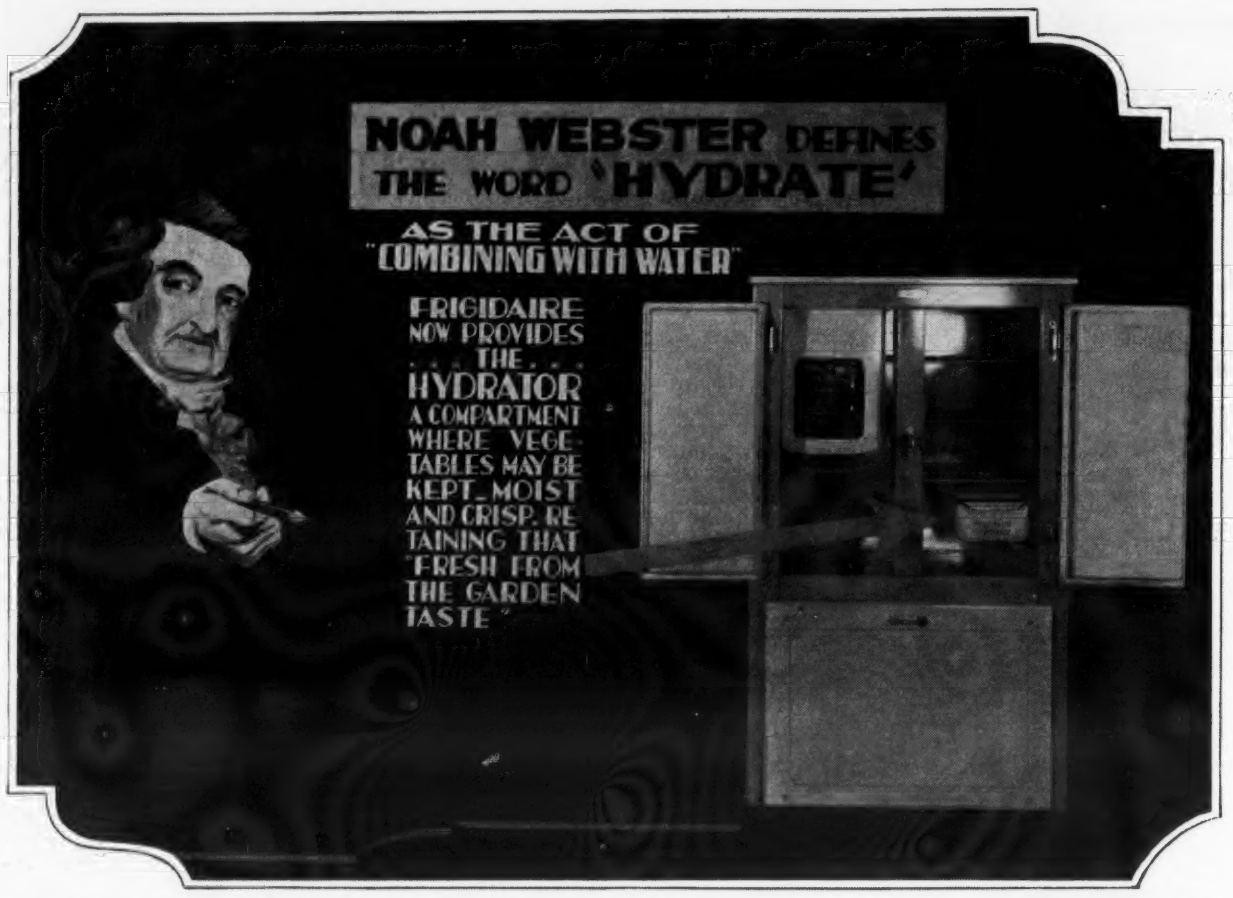
The compressor is known as the Norge Rollator. A roller turns smoothly within a cylinder and performs the function necessary to refrigeration. This principle eliminates the necessity of the piston, connecting rod and many other moving parts. The Rollator is permanently quiet, as the three principal parts operate submerged in oil, which insures less friction and gives it longer life, thus lowering operation costs, the company officials claim.

The freezing unit is equipped with vertical downdraft flues, which provide increased air circulation over the freezer and cause the cabinet temperature to lower quickly. The larger ice-cube compartment is enclosed by a self-closing porcelain door, which prevents the cubes acquiring flavor from food odors. This door also prevents the forming of frost on the trays, thus making them always easily removable.

A cold accelerator, adjustable to five points, is located on the front of the

(*Concluded on Page 8, Column 5*)

Noah and Frigidaire in Window Display


NOAH WEBSTER DEFINES THE WORD 'HYDRATE'
AS THE ACT OF "COMBINING WITH WATER"
FRIGIDAIRE NOW PROVIDES THE . . . . HYDRATOR A COMPARTMENT WHERE VEGETABLES MAY BE KEPT MOIST AND CRISP. RETAINING THAT "FRESH FROM THE GARDEN TASTE"

During the special demonstration campaign, the Central Hudson Gas & Electric Corp., Poughkeepsie, N. Y., emphasized the Frigidaire Hydrator in its window displays. The novel set-up pictured here was designed by Vernon Shepherd.

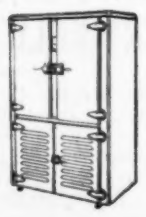
You can *see* why you can *sell* WILLIAMS ICE-O-MATIC

NEW CAPITOL *MODEL*

SEE this advanced new Williams Ice-O-Matic line, the low priced new Capitol model and the larger Models. A complete line of commercial compressors. Then you will understand why you can show Ice-O-Matic to your prospects and sell it with more profit.

For you, Williams engineers have combined the 15 most salable features of modern electric refrigeration. These sales building advantages are all grouped in this one new Ice-O-Matic line. Williams' production advantages keep down the price of this obviously high quality merchandise. Think how you can sell this beautiful cabinet (illustrated)—with full porcelain lining for its 4.7 capacity—at only $175 list, F. O. B. factory! Write or wire today for all the money-making facts on this new improved Ice-O-Matic line of domestic and commercial models. Get details of the new sales license direct from the Williams factory that gives you full discount.

The larger Williams Ice-O-Matic unit may be enclosed in any of five sizes of Crysteel Cabinets, or it may be installed in the basement. Size P-6 is shown



NEW CAPITOL MODEL

$175 and up at factory

Convenient terms

RADIO—*Williams Oil-O-Matics*—SUNDAY EVENING, 7:30 to 8:00 (Eastern Time) NBC Chain, WJZ, WBZA, WBZ, WLW, WHAM, WJR, WGN, KWK, WREN, KOA and KSL.
WEDNESDAY EVENING, 7:30 to 8:00 (Eastern Time) KDKA.
WEDNESDAY EVENING, 7:00 to 7:30 (Pacific Coast Time) KJR, KEX, KGA.
THURSDAY EVENING, 7:30 to 8 (Central Time) WGN.
SATURDAY EVENING, 8:00 to 8:30 (Pacific Time) KFRC KMJ, and KHJ.

ICE-O-MATIC DIVISION

WILLIAMS OIL-O-MATIC HEATING CORPORATION

Bloomington, Illinois

FRIGIDAIRE CONTINUING HYDRATOR EXHIBITIONS

Dayton, Ohio.—Reports from all sections of the United States covering the national demonstration, conducted by Frigidaire Corporation to acquaint the public with the advantages of its Hydrator, indicate that this improvement will do more to arouse interest in electric refrigeration and stimulate sales than did the national Cold Control demonstration, which marked the high spot of Frigidaire field activity in 1929, according to factory officials.

The demonstrations were scheduled to close on Saturday, March 22, but last minute information from the Frigidaire headquarters states that the Hydrator demonstrations will be extended through this week. In answer to the large attendance at the special exhibits, dealers and distributors in practically every city and town in this country are continuing the big drive. Frigidaire officials estimate that the attendance during Hydrator week will greatly exceed the response accorded during the special Cold Control week last year.

Typical of telegrams received from distributors and branch managers of the Frigidaire organization was one from C. N. Malouf, distributor for the Salt Lake City territory, embracing a number of western states. The telegram was in part as follows:

"Hydrator demonstration has aroused highest degree enthusiasm on part of the sales organization and the most receptive response from the public of any sales activity since this district was organized. Metropolitan operation in two days reports 120 calls, 69 hydrator sales to users, 277 prospects and 16 sales. Better returns to follow."

Three hundred visitors called at the Detroit showroom the first day, and more than six hundred the second. Nine hundred callers visited dealers' salesrooms in the Little Rock district during the first two days of the demonstration. Seven hundred were reported from the Memphis territory and six hundred from the New Orleans district.

Morris Williams, manager of the Fargo, North Dakota branch, reported more callers during the first two days of the Hydrator demonstration than during the entire ten-day demonstration of the Cold Control last year. "Dealers are showing great interest in the demonstration," he said.

Last year, in the neighborhood of 100,000 people called at Frigidaire salesrooms during a national demonstration to inspect the Cold Control, and a large percentage of these visitors purchased Frigidaire equipment during the demonstration or within a few weeks thereafter.

"We are of the opinion that the Hydrator will bring us even better prospects than did the Cold Control, and that a still larger percentage of visitors during the Hydrator demonstration will become Frigidaire users," E. G. Biechler, president and general manager, said. "The Hydrator is an improvement which appeals particularly to women. All users of electric refrigerators appreciate its advantages. They do not have to be sold on their need for it."

A number of branch managers and distributers reported that they are using radio announcements in connection with other publicity on the Hydrator demonstration. The Detroit branch reported that nearly one-half its callers during the first two days of the demonstration stated that their attention was called to the demonstration by the radio.

The Frigidaire Hydrator will be sold only to Frigidaire users, and no effort will be made to adapt it to other makes of electric refrigerators. Mr. Biechler said:

"Despite its simple appearance, the Hydrator represents a lot of experimenting and research," he stated. "It is designed to function perfectly in a household Frigidaire, when installed in accordance with directions. Its construction, exact location within the box to take full advantage of air currents, and many other features are the result of long and patient effort."

SERVICE MANAGERS

(*Continued from Page 1, Column 1*)

Kelvinator's Detroit branch. He went right through the operations of his department, giving facts and figures to support his statements. His description of the work was so thorough that it is reprinted elsewhere in this issue of ELECTRIC REFRIGERATION NEWS.

Two short talks on the part that motors play in service problems were given by P. H. Rutherford, of Delco Products Co., Dayton, and F. A. Oberheu, United Motors Service. Both speakers pointed out that motor troubles were a minor factor in the total number of service calls, the figure being about 5 per cent.

Roger K. Braun, of Kelvinator, then described the methods used by that company in keeping in touch with its service men throughout the country. Thirty field service representatives are on the road constantly, making calls on distributors and dealers and keeping the factory informed daily of conditions in the field. They conduct field schools for service men, organize district clubs and check stocks of parts and records. They form an extremely useful link between field and factory.

A. F. Dietz, Jr., of New York, who is in Detroit at present for the National Dairy Co., then demonstrated a remarkable machine which he finished only a short time ago, after experimenting over a period of several years. This machine, which he uses to teach service men how an electric refrigerator works, is equipped with glass panels at strategic points, so that the course and action of the oil and refrigerant can be followed with the eye while the machine is in operation. The machine was developed at one of the shops of the Arctic Dairy Products Co., of Detroit, in the same building in which some of the most important early work in the construction of ice cream cabinets was carried on. Mr. Dietz said, in part:

"Almost all of us know what to expect, even today, by way of service for a motor car. Producers of cars have much money invested in service equipment and training of men, yet fleet owners have been compelled to take over the servicing of their cars. This has always appeared to me to be a weak spot in the scheme of things, yet the producers are willing to stand by and do nothing about it. There are some few exceptions to this now.

"In the case of automatic electric refrigeration, we have the same picture with many elaborations. The producers of machines seem to take every precaution possible to standardize and control their output and carefully inspect and test many times during production. Yet it seems that, after installation in the field, no two machines are alike. A large percentage fail, and remain failures for a long time.

"I know of many ice cream companies buying equipment, installing it and having it fail. They then bought more, pulled in the failures, stored them in their warehouse, and promptly forgot about them. Many times the producers knew about it and yet let them get away with it. In the end it became a boomerang and somebody got hurt.

"A service bureau should be considered as being between production and use. That places it beside the Sales Department, and it should be considered as being a part of that department in any application of the word "Service."

"I would like to narrow my picture right down to that particular part of refrigeration that I have had the most experience in. That is sulphur dioxide refrigeration of ice cream in the stores of retail ice cream dealers, wherein the ice cream producer buys, installs, and maintains the equipment.

"There are two distinct kinds of service for this purpose now. One is given or sold by the producer of the machine, and the other is given by the ice cream producer. The latter was developed because the maker of the machine fell down on the job hopelessly.

"There is a third kind of service possible, that of the free-lance. This has not grown to any extent as yet. There has been several attempts at it, but they never got very far; I think the proposition of a guarantee has held them back.

"Under present conditions, the demands on the Service Department of an ice cream plant are most exacting. Their job is to get the longest useful life out of a machine with the lowest expense for replacement parts. Also, to make it give a very low temperature without the slightest variation, and at a minimum of expense for power. This in spite of an increasing number of abuses practiced by the dealer. The penalty, or cost of failure, is so great that we just cannot fail. The dealer appoints himself the best judge of whether or not the machine is performing properly, and he may put in an endless number of service calls, each of which must be honored immediately.

"The solution is control of the proper kind, and it must apply throughout the entire picture. It must apply to installation, and in that phase embraces choice of design and location and frequently reaches back to manufacture. It must apply to service in the field as well as repair in the shop. Then control must also apply to use. There must be some one at the head of the outfit who really knows what it is all about and whose word is law.

"Our service is as good as our men, and we must not expect them to be any better than we make them. It is necessary to constantly check up on them, and the results of their work in a way calculated to be most helpful to them. To do this it is not always necessary to go out in the field; most of this can be accomplished in the office by the use of any one of a number of office systems, if properly handled and kept up to date.

"I have seldom failed to inspire confidence enough in men to have them come to me daily with their problems. I have found that the average man has

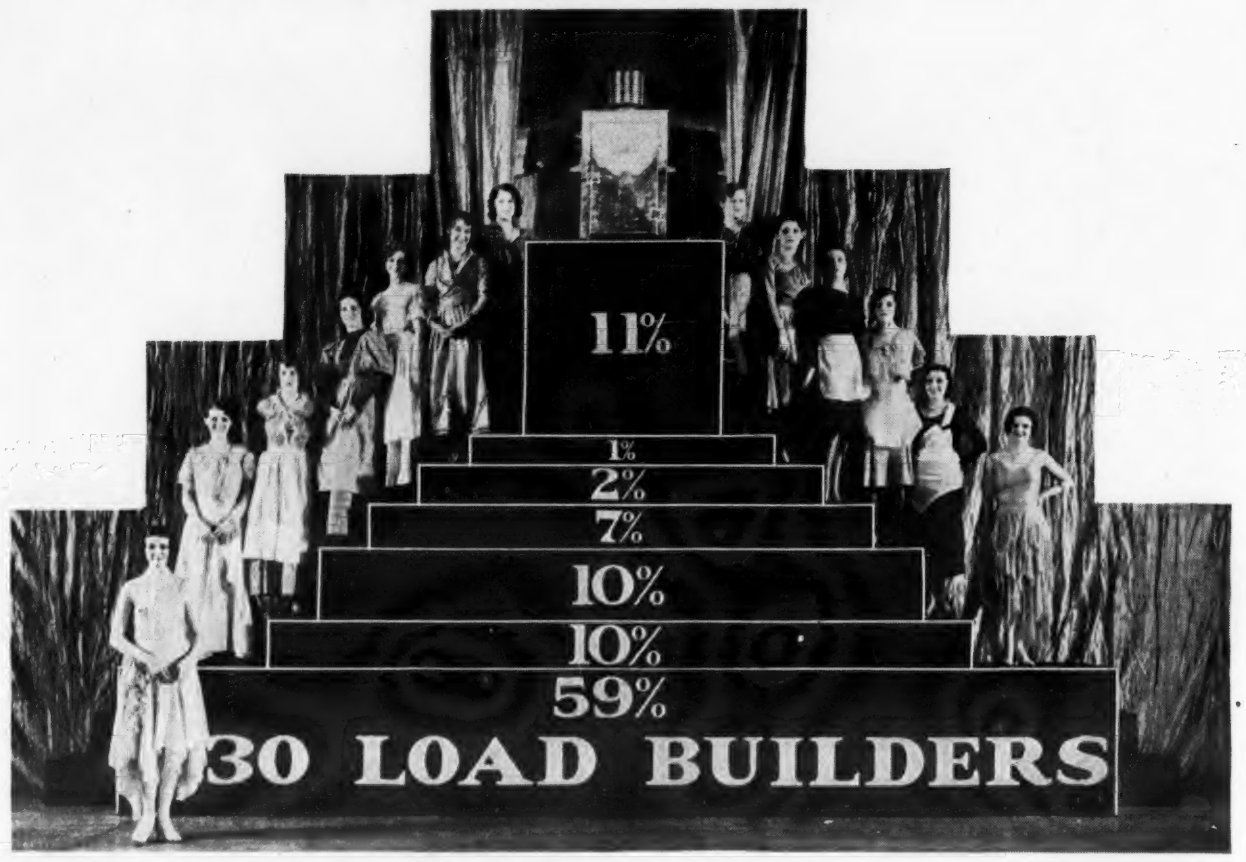
(*Concluded on Page 21, Column 1*)

No wonder it's a General Electric Year!

GENERAL ELECTRIC
ALL-STEEL REFRIGERATOR

ELECTRIC REFRIGERATION DEPARTMENT OF GENERAL ELECRITC COMPANY, HANNA BUILDING, CLEVELAND, OHIO

The 1930 Load Builders



THE idea of "1930 Load Builders" was dramatized in a pageant at the Rex Cole convention in New York City. Thirteen young women played in various roles which depicted the old and modern methods of doing household tasks. At the pinnacle the highly polished steel refrigerator indicates that it constitutes 11 per cent of the central station load. P. B. Zimmermann, sales manager of the electric refrigeration department of the General Electric Co., outlined in detail the load building possibilities of the refrigerator and the pageant served as a climax to his address.

REFRIGERATOR IS SECOND BEST AS LOAD BUILDER

New York, N. Y.—Central stations are gradually effecting a change in their domestic load building business, P. B. Zimmerman, general sales manager of the electric refrigeration department of the General Electric Company, declared here on March 17, when he addressed the annual sales convention of Rex Cole, Inc., metropolitan distributors for General Electric refrigerators. He spoke before the convention banquet, held in Hotel Commodore grand ballroom and attended by about 1,000 refrigerator specialists and central station men.

"In the past ten years, electric light and power companies added better than a million new domestic customers each year," he told those attending the banquet. "This new group has represented a large part of increased business for the central stations.

"But now, with 20,000,000 homes wired, there will be few new domestic customers to add and the purchasing power of these few will be limited. The increase in domestic business, therefore, must come from the present customers through the use by them of new appliances.

"The domestic kilowatt hour consumption has increased greatly since 1912. In that year it was around 3,000,000,000, while in 1929 it was around 18,000,000,000. The increase was great during the early years of that period, but during the last several years the increase has been smaller and there has been a trend toward a gradual leveling of the domestic kilowatt hour sales curve."

Mr. Zimmerman pointed out that the ideal appliance for revenue building, a current-consuming appliance with a uniform 24-hour load, has been more closely approached in the electric refrigerator than in any other household electrical appliance.

Today, he said, with approximately 20,000,000 homes wired for electricity, 9 per cent only have electric refrigerators. There is a potential market now of 10,000,000 homes and, he said, 5,000,000 homes could buy electric refrigerators this season if the industry had the sales power to reach these five million.

"We have started off 1930 in a most satisfactory manner. Our sales from January 1 to the middle of March were more than 50 per cent above those for the same period of last year. In view of the fact that January and February are usually low percentage months for us, we feel that with this wonderful start we will make 1930 the best year in our history."

Mr. Zimmerman's talk was punctuated by charts and diagrams of particular interest to central station men, as well as to refrigeration salesmen. Chart A showed the domestic kilowatt hour sales, as expressed in percentage of increase over certain periods from 1912 to 1930:

1912 to 1917	65	per cent
1917 to 1922	111	per cent
1922 to 1925	44	per cent
1925 to 1926	9	per cent
1926 to 1927	8	per cent
1927 to 1928	5.6	per cent
1928 to 1929	3.5	per cent

Following this graphic portrayal as to how the increase in domestic kilowatt hour sales was dropping, Mr. Zimmerman presented charts of one property which showed that by adding the refrigerator to a customer's line the net earnings of distribution, office expense—such as meter reading, bookkeeping and billing, taxes and depreciation, remained the same. Generating expense increased and sales promotion expense increased, but with other expenses remaining the same, the interest on the investment, profit, or net earnings, jumped upward.

Another chart presented by Mr. Zimmerman showed the appliance revenue figures, based on a ratio of 6.2 cents per kilowatt hour: (In the table A designates watt demand; B, annual K. W. consumption; C, annual revenue; and D, annual revenue per K. W. of demand.)

Appliance	A	B	C	D
Heater	600	42	$2.60	$4.33
Toaster	500	37	2.29	4.58
Wash. Mach.	300	25	1.55	5.02
Percolator	400	42	2.60	6.50
Iron	600	72	4.46	7.43
Vac. Cleaner	200	27	1.67	8.35
Fan	50	16	0.99	19.80
Oil Burner	300	265	16.43	54.77
Range	2500	1500	93.00	37.20
Refrigerator	300	725	44.95	149.83

Even when special rates are used, the refrigerator shows a greater annual revenue per K.W. of demand that any other electric appliance, and far outstrips its nearest competitor, the range, he said, in presenting the following figures (In the table A designates watt demand; B, annual K. W. consumption; C, rate; D, annual revenue; E, annual revenue per K. W. of demand.)

	A	B	C	D	E
Range	2500	1500	3	$45.00	$18.00
Refrigerator	300	725	3	21.75	72.50

This idea was dramatized in a pageant which served as a climax of Mr. Zimmerman's talk. The pageant, entitled "The Triumph of Electricity," and including in its cast thirteen young women, dramatized the fact that lighting constituted 59 per cent of the central station load; washing, 1 per cent; ironing, 10 per cent; sweeping, 2½ per cent; cooking, 10 per cent; other appliances, such as fans, heaters, toasters, etc., 5½ per cent, and the refrigerator, 11 per cent. The refrigerator, Mr. Zimmerman declared, was the load builder of 1930, and that although still an infant among electrical household appliances, it was destined to grow to big proportions as a central station load builder.

The cast for the pageant included girls representing the "Light of By-gone Days," "Modern Light," the "Spirit of Vanished Wash Days," the "Spirit of Modern Wash Days," the "Spirit of Vanished Ironing Days," the "Spirit of Modern Ironing Days," the "Spirit of Yesteryear's Sweeping," the "Spirit of Nowadays Sweeping," the "Spirit of By-gone Cooks," the "Spirit of Present Day Cooks," the "Spirit of Ancient Discomforts," the "Spirit of Modern Comfort," and the "Last Miracle of Progress."

Gerard Swope, president of the General Electric Company; T. K. Quinn, general manager of the electric refrigeration department of the General Electric Company; and M. S. Sloan, president of the National Electric Light Association and president of the New York Edison Co., were among the banquet guests.

hear ye!

the same cry as of yore

"black steel sheets do not offer the rust-resisting qualities that are essential—and while it has been proven that zinc is the best protective coating for black steel sheets, paints, lacquers or enamels do not adhere satisfactorily to a galvanized sheet."

the term "galvanized" is applied to a zinc, or what is commonly called spelter, coated sheet. This coating contains certain elements that prevent the applied finishes from properly bonding.

referring to refrigerator *and* ice cream cabinets

where condensation is prevalent a ***rust-resisting spelter coated*** sheet metal to which the finish will ***securely bond*** is most practical.

Superior Galvannealed PATENTED PROCESS

for the finest cabinets

Super-Metal is made from a special analysis, copper content steel and coated with prime spelter and alloys. After the sheet is coated it is HEAT-TREATED which thoroughly amalgamates the coating with the base metal and destroys the elements that prevent the finishes from bonding.

Superior Galvannealed—While slightly lower priced this sheet has met the requirements of some of the best known manufacturers of refrigerating units and metal cabinets. It is a heat-treated sheet similar in many respects to Super-Metal. Both sheets can be furnished stretcher leveled. Sheets are ductile and resist flaking or peeling under the most difficult forming.

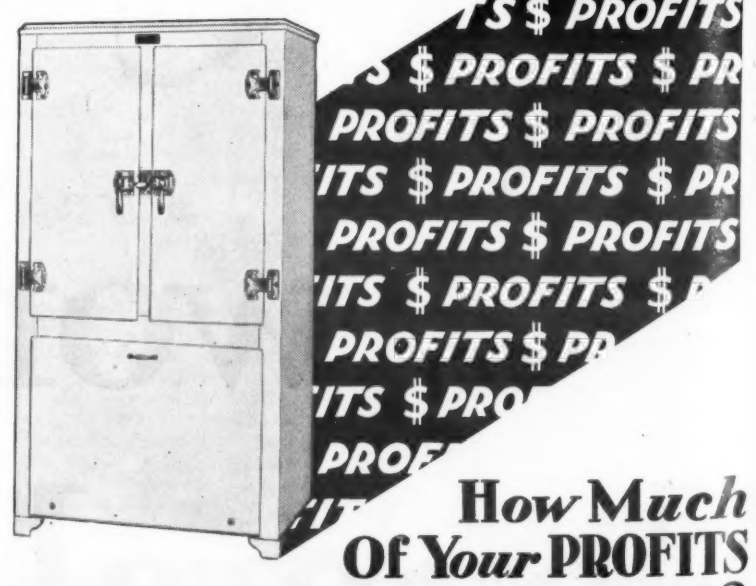
Superior "Super-Metal" PATENTED PROCESS

The Superior Sheet Steel Co.

Division of Continental Steel Corp.

Canton, Ohio

Manufacturers of Black, Galvanized, and Long-terne Sheets



How Much Of Your PROFITS STAYS IN THE BANK?

That's an imp rtant question for every Electric Refrigerator Dealer and Distributor to consider. No matter how big your volume may be—unless a good portion of your profits—remains NET profits—you are not making the money you are entitled to.

If your NET profits are constantly being reduced by servicing charges, it will pay you to investigate WAYNE ELECTRIC REFRIGERATORS.

For here is a unit built to reduce servicing costs to a minimum.

Write us today. Let us tell you of this new improved WAYNE with its Automatic Cold Control. Let us tell you of the new merchandising plans, that are certain to increase your sales.

Let us tell you of our finance plan. Study the obvious advantages of each of these features—at your leisure. You'll find it mighty profitable reading, we're sure.

WAYNE HOME EQUIPMENT COMPANY, FORT WAYNE, INDIANA

WAYNE ELECTRIC REFRIGERATOR

PIONEER ENGINEER NOW WITH COPELAND PRODUCTS

Mt. Clemens, Mich.—One of the veterans of electric refrigeration and a developer of many of the parts employed in electric refrigeration machinery and of processes used generally in the industry, is now affiliated with Copeland Products, Inc., according to an announcement by Louis Ruthenburg, president. He is John R. Replogle, who has been named chief engineer of Copeland.

Replogle's activities with electric refrigeration date back to 1919, when he was chief engineer of Frigidaire. Later he was chief engineer for Nizer, and one of its organizers, and is credited with perfecting that company's compression

J. R. Replogle

type machine. He continued with Nizer following its merger with Kelvinator, remaining with the latter company until 1928, when he retired. Earlier connections were with Western Electric Company, from 1910 to 1915, as head of the inspection-investigation division laboratories, and as director of research for Remy Electric Company and General Motors Laboratories, in 1918 and 1919.

Among the parts, systems and methods now used generally in the industry for which Replogle is known, are the flooded evaporator system with float control, as applied to small units, and improvement in control of unit operation now quite generally employed.

FLORIDA KELVINATOR MEN SMASH QUOTA IN DRIVE

Orlando, Fla.—The Refrigeration Jubilee at Orlando, Fla., January 15 to March 1, set a mark for the other properties of the Associated Gas and Electric System to shoot at. The final score was 440% above quota. The Orlando district, piloted by C. B. Hayes, made 420.5% of quota; the DeLand district, under Pilot C. E. Hill, made 430.7% of quota; the Eustis district, under Pilot W. J. Clapp, hit the 341.6% mark; and

H. R. Cloud

the Lake Wales district, under Pilot W. W. Wolff made 562.5% of quota.

"Bob" Moore, of the Orlando division, led the entire Florida Public Service Co. in the number of Kelvinators sold.

In setting a quota for W. B. Raulerson, team No. 6 of the Orlando district, his selling capacity was very greatly underestimated. To prove it he made nearly 966% of his quota, and personally sold more Kelvinators than any other man in the district except "Bob" Moore and J. W. Hall, at Lake Wales.

Richard Owen, directing sales in the Jubilee under General Jubilee Manager A. E. Ward and Division Jubilee Manager H. R. Cloud, made a fine record in the southland.

A. E. Ward, general Jubilee manager, was jubilant over the outcome of the campaign. Nobody is more pleased at the outcome of the "tryout" refrigeration Jubilee in Florida than is H. R. Cloud, commercial manager of the Florida Public Service Co., who was division manager of the Jubilee. Mr. Cloud set the stage for the event, lined up the teams and inspired the various salesmen to do their stuff with vigor and determination.

PETERSON HAS NEW POST WITH REX COLE DIVISION

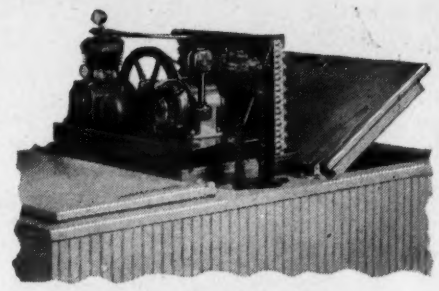
New York, N. Y.—The promotion of Thomas S. Peterson to the position of Sales Director of the Bronx Apartment House Division of Rex Cole, Inc., 265 Fourth Avenue, marks the expansion of this department as well as the move of Bronx headquarters into a new modernistic showroom. Mr. Peterson, who was formerly an Apartment House Specialist with this concern, closed his first

T. S. Peterson

year with a record of having sold 1,500 General Electric refrigerators exclusively in occupied building sales. Mr. Peterson is planning to make his division a strong one in the Rex Cole organization.

DOUBLE YOUR MARKET by Adding Farm Refrigeration Now!

THE Dairy Refrigeration Company are specialists in this particular field. Their years of research, and practical, engineering experience in farm refrigeration have resulted in a unit which produces TWICE THE CAPACITY . . . AT HALF THE PRICE. Now Nationally advertised in "Electricity on the Farm."



DEALERS:
Cash in on this Spring's business
Write for open territory

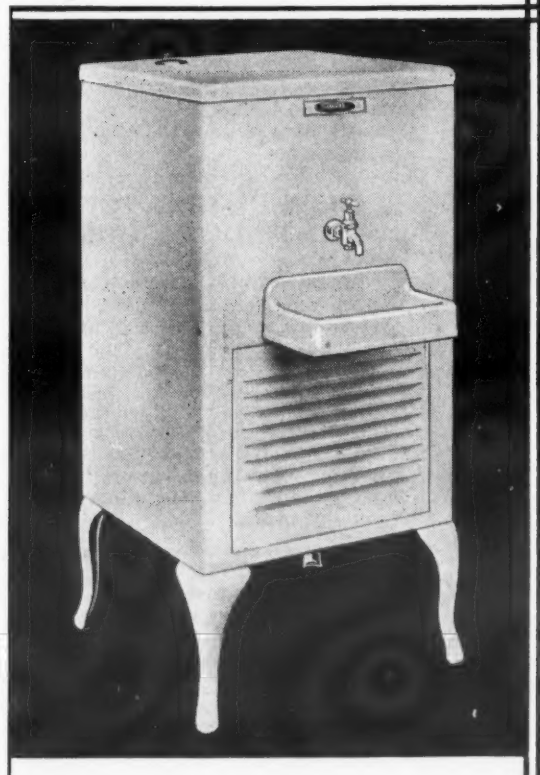
Glenn Dairy Icer
"A machine that will do the work . . . at a price you can afford to pay."

DAIRY REFRIGERATION COMPANY
Dept. E. 311 - 64th Ave. Milwaukee, Wis.

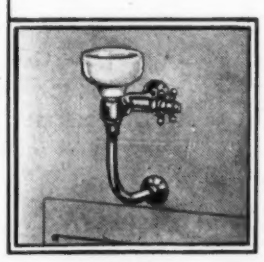
OFFICES
STORES
FACTORIES
THEATRES
HOSPITALS
SCHOOLS
BANKS
RESTAURANTS
HOTELS
CLUBS
HOMES

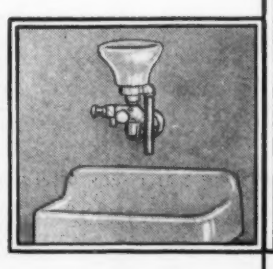
In your city . . .

HUNDREDS OF LIVE PROSPECTS *for* Servel Water-Coolers



WC-5 FAUCET TYPE
The capacity of all models is 3 gallons per hour. 5 coat lacquer finish in mahogany, olive green or white.





WC-5 BUBBLER TYPE
All cabinets of all-steel construction with corkboard insulation; only 21½ inches of floor space required.

WC-5 COMBINATION TYPE
All models equipped with Servel 14-A refrigerating unit. Chromium plated hardware throughout.

THE need for a plentiful supply of pure, chilled drinking water is recognized by everyone.

Servel meets the vigorous demand for a convenient and economical source of supply with these three beautiful new models . . . sanitary, silent, entirely automatic, wholly dependable.

Hundreds of profitable sales are waiting in every city . . . a tremendous market almost untouched.

Servel dealers can close these sales . . . with coolers that answer every practical requirement . . . that deliver more cold water from the same amount of electric current.

Complete Series of Commercial Units

Every type of commercial installation is served effectively and economically by Servel Electric Refrigeration.

The Servel Commercial Series is the most complete ever presented by any manufacturer . . . with air-cooled and water-cooled machines ranging in capacity from 75 to 1200 pounds ice melting equivalent.

Servel chilling sections in assorted sizes, proportions and designs care for any type of refrigerator, cooler or display case.

Write for facts

The dealer who holds the Servel Franchise is best equipped to go after the highly profitable commercial installations . . . with proven operating economies and absolute dependability to help him close his sales.

Write and learn whether the Servel Franchise is still available in your territory.

SERVEL SALES, Inc.
Evansville, Indiana

The Imitation Food Products Co.
(Branch of The Artistic Production Co.)
107 Lawrence Street
Brooklyn, N. Y.

Ask for our catalog of January 1, 1930. Direct sales only. "Indispensable with refrigerator display."

Home Service Directors Who Have Big Share in Keeping G. E. Sales On the Top

THE group of women who attended the Home Service Conference of the General Electric Company, Electric Refrigeration Department, in Cleveland. Miss Edwina Nolan, the company's home service director, occupies the place of honor in the center of the first row. The picture was taken in the G. E. Refrigeration Institute. Those in the photograph are:

First Row. From Left to Right: Bertha M. Harris, Consuelo Kelly, Roxy M. Speed, Helene J. Foster, Grayce Darling, Edwina Nolan, Helen M. Kile, Nellie M. Snavely, Emma Maurice Tighe, Marion Dow, Eleanora Sense.

Second Row, L. to R.: Paul H. Dow, W. J. Daily, Dr. Louise Stanley, Mary E. Parker, Edna R. Steiner, Helen Murray, Thelma Davis, Hazel M. Fletcher, Laura A. Goewey, Alice Robertson, Helen Treter, Helen Robertson, E. M. Geraghty, Louise Pollack, Lois Tenny, Susan W. Sevin, Florence M. Beck, Frank Cockrell, P. B. Zimmerman, S. C. Griswold.

Top Row, L. to R.: H. N. Trumbull, Grace Poslar, Elizabeth R. Carson, Emma Jane Roberts, Della Kaufman, Miss Turney, Blanche D. Flynn, Maurine Jane Struthers, Ruth W. Oswald, Jennie Payne, Lois Scofield Fitter.

EASTERN KELVINATOR MEN PLAN SPRING ACTIVITIES

Springfield, Mass.—Springfield Kelvinator Sales, Inc., opened its spring season with a dealers' meeting for four counties of central and western Massachusetts, Feb. 22. The meeting was addressed by Philip M. Johnson, sales manager for southern New England of the Kelvinator branch in Boston; Henry Dolan, sales manager for Boston, and Trafton Mason and M. C. Knight, general sales manager and wholesale manager, respectively, for Springfield Kelvinator Sales, Inc. Reports from various localities in the district point to a good sales year.

This company has converted an ice box employed to cool 1,600 quarts of milk for the creamery of C. H. Mansur & Son, Westminster, Mass., into an electrical system by installing a large Kelvinator unit.

FLINT DISTRIBUTOR SEEKS RECORD SALES MARK

Flint, Mich.—Electric refrigerator sales here should set a record in 1930, according to A. F. Schmitdke, vice-president and general manager of the Allen Electrical Co., Flint distributors for Frigidaire. Mr. Schmitdke expects his firm to make 1930 its peak year.

Over a five-county territory, the Allen Electrical Company's refrigerator sales for the first quarter of 1930 were 20 per cent more than for the same period of 1929, also a record year, Mr. Schmitdke reports. Since January 1, during a period when much was heard of financial depression, business slump and unemployment, the company added five men to its sales and service force.

With 20 sales and service men, the Allen Electrical Co. sells in five counties through a connection with the Consumers Power Co., which supplies gas and electricity in this territory. A salesroom is maintained in the utility's office in each county seat: Flint in Genesee county, Owosso in Shiawassee, Alma in Gratiot, St. Johns in Clinton, and Mt. Pleasant in Isabel county. Two men, trained in both sales and service schools, have charge of each salesroom outside of Flint, where there are 10 besides two handling commercial jobs exclusively. V. E. Zetterberg is in charge of refrigerator sales and service.

ELECTROLUX AND SERVEL ARE ACTIVE IN NEW ENGLAND

Bridgeport, Conn.—Electrolux exceeded its sales quota for February by a wide margin in the southern New England area, according to Wallace D. Taylor, district sales manager. Distribution for both Electrolux and Servel in Connecticut, Rhode Island and part of Massachusetts is handled by Atlantic Utilities, Inc., of this city, of which Philip E. Allen is president.

Fifteen Servel water-coolers have been installed in the new plant of th Sikorsky Aviation Corporation here by the Atlantic firm.

A. R. Carlson of the Hartford Gas Light Co., Hartford, Conn., has been appointed sales manager of the concern and is inaugurating a campaign on Electrolux. He has a sales organization of eight men.

The Palmer Gas Co., Palmer, Mass., has taken on the Electrolux line for local retail distribution. H. B. Sanborn is sales manager.

NEW DISTRIBUTOR FOR FINDLAY, OHIO

Findlay, Ohio.—The Toledo, Bowling Green and Southern Traction Company, subsidiary of the Empire Public Service Company, Philadelphia, Pa., has opened headquarters for the distribution of Kelvinator here, with John Broerman, merchandise manager, in charge of operations. The establishment is located at 120 South Main Street, in the heart of Findlay's business district. A five-week selling campaign will be inaugurated at Findlay, April 15.

LUTZ CO. PREPARES FOR BIG YEAR

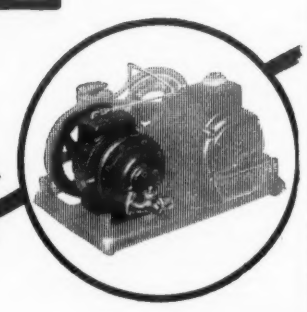
Dayton, Ohio—Business is good and will continue to improve each month this year, said F. P. Lutz, of the F. P. Lutz Company, the Dayton distributor for the General Electric refrigerator.

As a basis for his prediction, he announced that sales of General Electric refrigerators in this territory for January, 1930, showed an increase of over 200 per cent over those of January, 1929. Reports submitted at the Cleveland convention by those attending from all parts of the country revealed an optimistic viewpoint of general business conditions, he said.

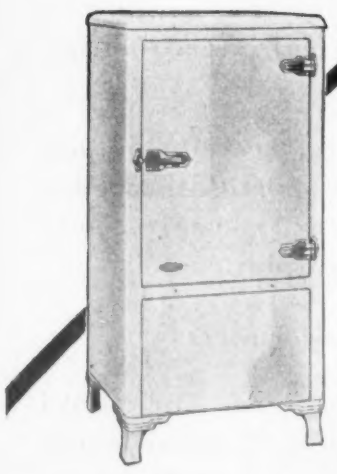
NEW COMPANY WILL SELL WESTINGHOUSE MACHINE

Dayton, Ohio—Among recent Dayton firms to be granted charters is the Electric Refrigerator Company, which will have the local agency for the Westinghouse refrigerator. The new agency has not yet selected its headquarters.

SENSATIONAL
ANNOUNCEMENT
BY
NORGE CORPORATION



PACKAGE MERCHANDISE
OF SENSATIONAL QUALITY—
AT SENSATIONAL PRICES



Norge cabinets are masterly conceptions of artistic beauty which add attractiveness to any kitchen. All modern features—some exclusive to Norge—including Cold Accelerator with five freezing speeds—ice cube compartment protected from food odors by self-closing door—high grade insulation—porcelain lining—unusual abundance of ice cubes—chromium plated hardware of exclusive design—defrosting switch—concealed tubing.

THIS announcement is revolutionary. Possible to Norge only because of the radical simplicity of the Norge Rollator or compressor. Cabinets of the best grade, with all the worthwhile convenience features known at high price levels, plus exclusive Norge features—all made possible by the manufacturing economies designed into the mechanical heart of the system.

Still more! Rollator simplicity means reliability, quiet, long life. It means a tremendous reduction in service work. It means the dealer can sell Norge off the floor like package merchandise. He needs no trained service man.

Norge refrigerators are shipped complete ready for installation. Just uncrate and plug in. The entire Norge refrigeration system can be quickly removed and replaced by one man with one simple tool without moving the cabinet.

Norge, in fact, is the electric refrigeration which retailers of every size have waited long to find—the great surprise—a challenge to the industry—and a boon to the public.

Retail outlets will be limited in number—and first class in character. If you feel that you can handle Norge to your and our advantage, write us for further information.

NORGE
CORPORATION, DETROIT
Division of
BORG-WARNER

Norge is Proved by 7 Years World-wide Use. Backed By The $50,000,000 Borg-Warner Corporation

SUPER
AUTOMATIC OIL HEATOR

The
Super Ceramic

offers a new method of installation, exclusive with the SUPER Automatic Oil Heator, which both eliminates the noise, and increases the efficiency, of oil heating.

Write for the booklet entitled "Silence".

THE SUPER OIL HEATOR CO.
PAWTUCKET, RHODE ISLAND

ROCHESTER'S ORDINANCE LIKE UNDERWRITERS' CODE

Rochester, N. Y.—Refrigeration is covered in Section 30 of the Public Safety chapter of the Municipal Code, adopted recently by the Council of the City of Rochester. The refrigeration section of the code follows closely the 1930 edition of the National Board of Fire Underwriters' Code. It reads as follows:

Sec. 30. REFRIGERATION.

A. Permissible systems.

Except in plants used exclusively for ice making or cold storage, irritant or flammable refrigerant in any individual unit or system shall be limited to one hundred (100) pounds, provided that the Commissioner of Public Safety may permit systems of unlimited capacity if the following provisions are compiled with:

1. Refrigeration shall be by the indirect method, except that direct refrigeration may be permitted in rooms, vaults or other spaces used for storage only, or in connection with a manufacturing process located on the ground floor only and with adequate exit facilities.

2. Each compressor shall be in a special machinery room, with suitable exit to the outside and with adequate ventilation to the outside.

3. Remote control shall be provided such that all machinery can be shut down without entering the machinery room.

4. Suitable mask shall be provided.

5. All doorways between the machinery room and other parts of the building shall be normally closed and shall be tight fitting. No other openings between the machinery room and other parts of the building shall be permitted.

6. All refrigerant piping shall be standard or extra heavy pipe, with joints suitable for the refrigerant, shall be rigidly fastened in place, and when passing through any part of the building not listed below, shall be encased in continuous piping, unless suitable ducts are provided in the walls, floors or columns.

7. Every portion of the system which can be isolated by valves must be designed for the maximum pressure which may result from the refrigerant, or must be provided with a suitable pressure relief device.

8. Systems not exceeding one hundred (100) pounds of refrigerant and supplying more than two evaporators may use seamless copper tubing of not less than .034 inches wall thickness, provided the tubing from the compressor manifold is installed in iron pipe or other metal enclosure, with suitable metal boxes for the manifold and for all other valves except those at the evaporator. Flexible metal enclosures may be used at bends or at terminals if not exceeding six (6) feet in length and rigidly fastened to connecting pipe and/or valve boxes. Each run of pipe shall be sealed or plugged at each junction box inlet with a material not affected by moisture or the temperature of the line. All joints shall be accessible and shall be of sweated types, except that flared joints may be used for tubing not more than five-eighths (5/8) inch in diameter. Enclosures shall be rigidly secured to the walls or other support. Tubing shall be independently supported in such a manner as to prevent excessive vibration and strains at joints and connections. Valves, service connections and joints in tubing shall be rigidly secured in suitable metal boxes at accessible points.

B. Unpermissible systems.

No system exceeding one thousand (1,000) pounds of flammable refrigerant shall be permitted within the fire limits of the City of Rochester.

C. Restrictions on installation.

No system shall be placed in operation until the complete installation has been tested by the installer in the presence of the authority enforcing this ordinance. A certificate of approval shall be posted on the premises where the system is installed. Tests shall include a vacuum test of the complete piping system, preferably with the evaporators installed, but valves thereon may be closed to prevent withdrawal of the refrigerant; under this test a vacuum of twenty (20) inches of mercury shall be placed upon the system and shall be held for a period of twenty (20) minutes, with no detectable drop, after the pump has been stopped.

After the vacuum test, the system of piping shall be tested by application of the pressure as indicated in the table below:

	Test Pressures	
	High Side Part	Low Side Part
	Lbs.	Lbs.
Refrigerant Used	Per Sq. In.	Per Sq. In.
Carbon dioxide	1,500	750
Ammonia	300	150
Methyl chloride	180	80
Sulphur dioxide	135	50
Iso-butane	130	50
Butane	75	35
Ethyl chloride	50	25
Methylene chloride	15	15

Compressors not located in a machinery room shall not be located under stairways or near dumb waiter or elevator shafts; shall be located as nearly beneath the riser as practicable; shall be preferably not in a room containing storage of combustible material; shall in any case be located at least 10 feet from storage; shall be located in an accessible part of the building with adequate lighting facility provided; and shall be protected against mechanica injury by a non-combustible partition, or by heavy metal netting secured to two- by four-inch wooden studding or to metal posts.

Shut-off valves shall be installed at the following locations: At each service outlet in pressure and return lines, and in each riser or manifold connection at or near the compressor. These valves shall be fitted with a hand wheel or other means of ready operation as an integral part thereof.

Valves in service connections shall be located outside of refrigerating unit, and at such distance above the floor as to provide ready accessibility.

Evaporators which may be removed as a unit shall have valves permitting the removal of the evaporator with valves attached.

D. Service connections.

No outlet or junction box shall be be supplied from an outlet box on a main riser. Such outlet box shall be located within the premises of the tenant served and so arranged as to be accessible at all times.

Not outlet or junction box shall be permitted in any hallway, stairway or vertical shaft not cut off at each story. Elevator, dumbwaiter or other shafts containing moving objects shall not be used for outlet or junction boxes, nor for tubing or piping carrying refrigerant.

Every refrigerator shall be rigidly secured in place.

E. General regulations.

Every system containing over one hundred (100) pounds of refrigerant which operates above atmospheric pressure, and every water-cooled system containing over twelve (12) pounds of refrigerant and capable of producing a pressure in excess of the test pressure, shall be provided with a pressure limiting device.

Each system containing over one thousand (1,000) pounds of refrigerant shall have compressor or generator protected by a pressure-relief valve connected into the high pressure side between the main stop-valve and the compressor or generator, to relieve excessive pressure into the low pressure side of the system or to the atmosphere.

The low pressure side of every system containing more than one thousand (1,000) pounds of refrigerant shall be provided with a hand-operated relief for discharging the refrigerant in case of fire, either to the atmosphere or to a suitable body of water. For systems containing irritant or inflammable refrigerants, the discharge to the atmosphere shall be through a proper diffuser above the roof of buildings within 50 feet. When such systems are located in closely built sections, the Commissioner of Public Safety shall require the discharge to the sewer through a mixer, provided with a check valve and a two and one-half (2½") inch fire department hose inlet through which the necessary water can be supplied.

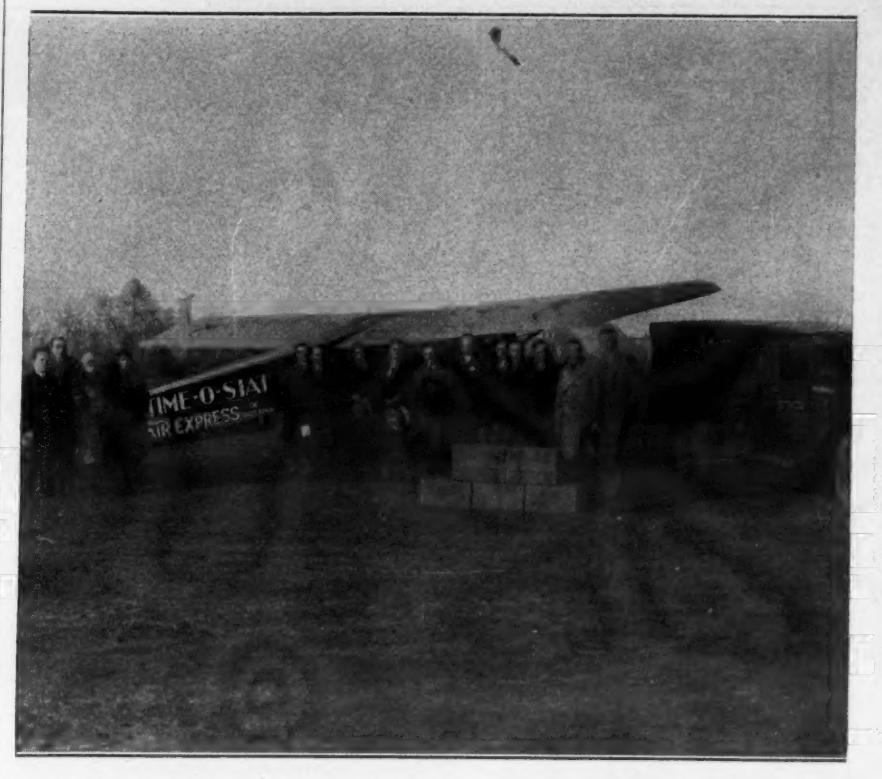
The hand-operated relief valve shall be located outside the machinery room, or shall be capable of operation from the outside.

A rupture member may be substituted for the relief valve in carbon dioxide systems operating below atmospheric pressure.

STEFFENS SUCCEEDS CORCORAN

Chicago, Ill.—Ralph Steffens has been appointed manager of the Electric Association of Chicago to succeed R. Bourke Corcoran, whose resignation was announced in the March 12 issue of the NEWS. Mr. Steffens is a graduate of the University of Chicago and has specialized in finance work. He was formerly with the Harris Trust & Savings Bank and the Northern Trust Company, both of Chicago.

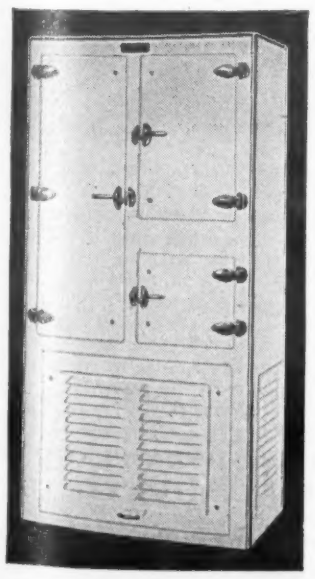
Time-O-Stat Uses Airplane to Handle Rush Order



THE Time-O-Stat Distributing Company of Indianapolis, factory distributors in Indiana for the Time-O-Stat Controls Company, of Elkhart, Indiana, recently provided special airplane service to deliver a rush order of controls to an Indianapolis company.

A Curtis De Luxe Robin was chartered for the service. Robert C. Winslow, president of the Time-O-Stat Distributing Company, and Albert B. Stine, manager, made the flight to Elkhart to secure the controls and to arrange for handling future business in this way when occasion requires. Everything went as scheduled on the first trip.

"It was built by BOHN"



The name BOHN is our warranty that the finest materials obtainable have been utilized by skilled craftsmen and refrigeration engineers to build for you this beautiful and scientific product—an all-porcelain BOHN refrigerator.

BOHN installations include many of the leading hotels, restaurants and hospitals in America.

BOHN refrigerators are used exclusively on all Pullman-built railway dining and buffet cars.

The United States War Department has purchased hundreds of all-porcelain BOHN refrigerators for our army barracks and battleships.

In choosing BOHN refrigerators, discriminating home owners throughout the country have given BOHN a representative list of which any manufacturer might be proud.

The handy base cabinet may either be used for refrigerating machinery or the storage of cooking utensils, canned goods, vegetables, etc.

Write for details of the remarkably low prices that are now prevailing.

BOHN REFRIGERATOR COMPANY
SAINT PAUL, MINNESOTA

ANACONDA

The die-pressed parts illustrated are typical of those supplied by The American Brass Company. Sample parts showing the quality and finish of Anaconda Die-Pressed Parts will be furnished on application. Publication B-9, containing full information, sent on request.

DIE-PRESSED PARTS

effect production economies

ANACONDA Die-Pressed Parts are dense, close-grained and free from spills and blowholes common in sand castings. The absence of hidden flaws minimizes rejections, which are particularly costly in the case of castings already machined.

Die-Pressed Parts are lighter in the rough and closer to dimension, requiring little machining... this reduces scrap loss. Where finishing is necessary, their smoother surface speeds up the operation and they can be highly polished at several times the rate possible with ordinary castings.

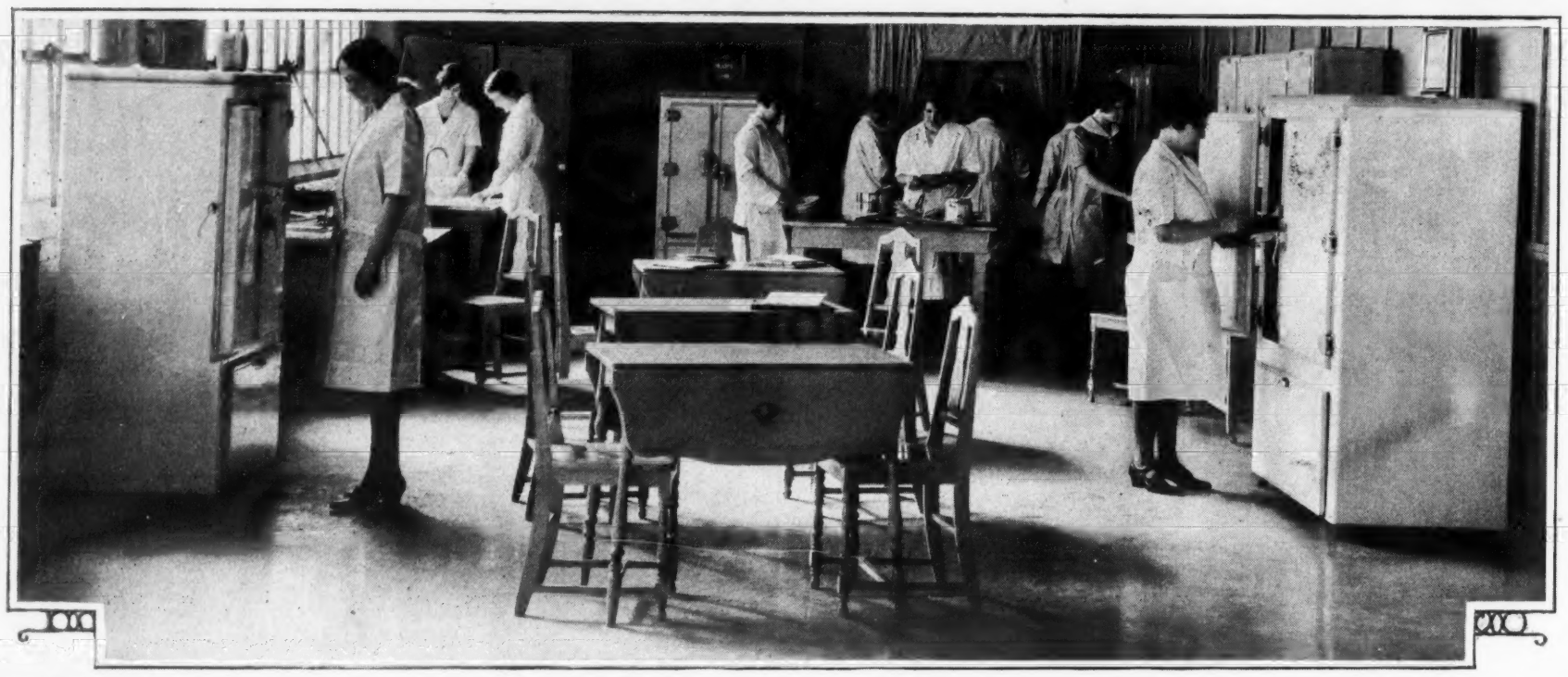
Wherever advantage may be taken of their high strength—nearly twice that of brass castings—a saving in material costs can be effected by using less metal.

Quotations may be secured by sending blueprints, sketches or models of parts required, mentioning quantities. Full information on request, or a representative will call at your convenience.

THE AMERICAN BRASS COMPANY
General Offices: Waterbury, Conn.
Offices and Agencies located in Principal Cities

ANACONDA
DIE-PRESSED PARTS

Kelvinator Mixes Work With Play at Four-Day Meeting of Home Service Department



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demonstrations. This was followed by tests of the freezing time of ice cubes in Iso-Thermic trays.

Friday's program consisted of experimental work in the Kelvin Kitchen, and the girls made various frozen salads and desserts in the recommended Kelvinator-way.

In the afternoon, Mr. Mason and Mr. Burritt met the girls and talked to them a few minutes. Following them, R. B. Owen told about the successful completion of the Florida Public Service Company's campaign. Those in attendance were:

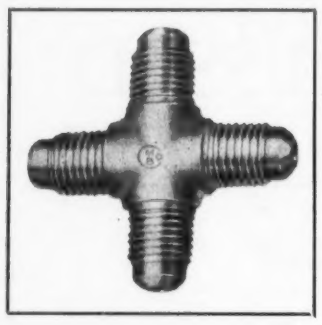
Blanche Flynn, Commonwealth Edison Co., Chicago, Ill.; Marie Tudor, Utilities Service, Inc., Indianapolis, Ind.; Catherine Wolf, Wolf Hardware Co., Centerline, Mich.; Mrs. Gartshore, Electrical Specialties, Ltd., Hamilton, Ont.; Doris Gregory, Robert Simpson Co., Toronto, Ont.; Mrs. A. H. Warne, Kelvinator-Bohman Co., Hagerstown, Md.; Betty Spear, Kelvinator-South Bend, South Bend, Ind.

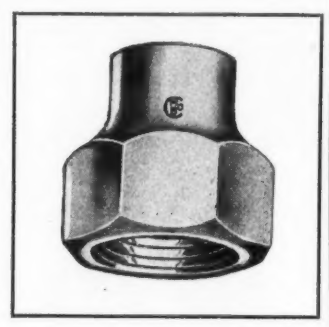
Kelvinator office employes attending the course were "Peggy" Lyttle, Norma Collinson, Mary Powrie and Mrs. Ralph Todd.

The course was conducted under the supervision of Miss Kirk, who was assisted by Miss Sawyer and Miss Sadie Chase. Throughout the week the visitors were treated as factory guests. They were entertained with a dinner and bridge party at the Women's City Club, Tuesday night, Miss Kirk and Miss Collinson acting as hostesses. The prize winners were: First, Marie Tudor; second, Mrs. Warne; third, Doris Gregory. Consolation prizes were presented to the losing visitors.

On Thursday evening the visitors were guests at a dinner and theatre party, at which Miss Kirk, Miss Sawyer and Miss Chase were hostesses.

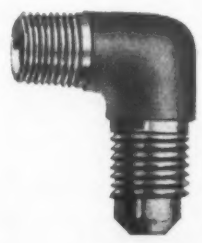
MUELLER FORGINGS ARE VITAL to the Business Building of Refrigeration





Without forgings the mechanical refrigerating industry could not have progressed to the position of universal use it enjoys today. Castings, with their attendant porosity and flaws, cannot be used with any measure of safety. With forgings only can you be sure. Mueller Refrigerating Fittings are forged under great pressure, are tremendously strong and have a dense, close grained structure. Seepage is impossible. Mueller Forged Valves and Fittings are your insurance against future trouble.

Mueller Brass Co. Valves and Fittings are approved by the Underwriters' Laboratories of Chicago.

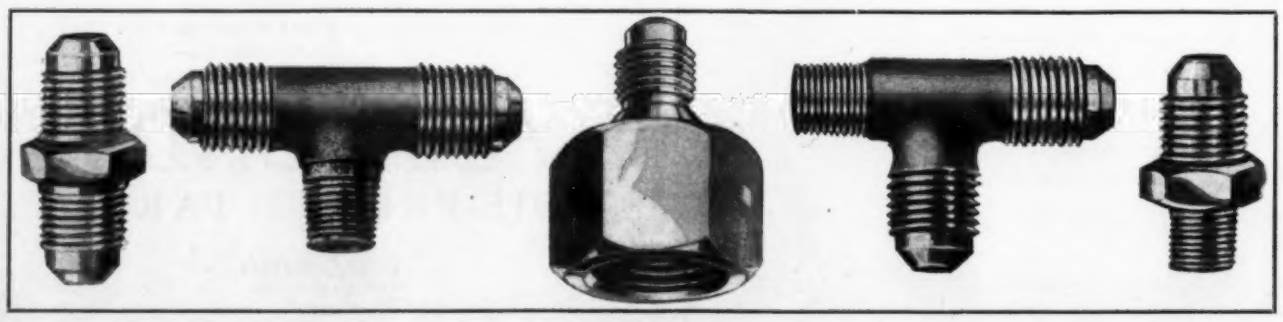


We manufacture a complete line of Valves and Fittings and can supply your every requirement.

Mueller Brass Co.

PORT HURON, MICHIGAN

Three Generations of Brass Making



SCHAEFFER SETS DIZZY PACE

Clinton, Ill.—Selling $6,300 worth of equipment during the first 60 days as an electric refrigeration salesman, and a total of $21,000 worth at the end of the first six months, is the record of George Schaeffer, Frigidaire salesman for the Interstate Power Company here. Clinton has a population of about 6,000.

With no refrigeration selling experience behind him, and armed with the lessons gained in one week at the Frigidaire factory school and another week with the manufacturer's district manager, Mr. Schaeffer went to canvassing and selling for an average of ten hours a day, hanging up a sales record which excited the envy of many of his confreres.

Mr. Schaeffer believes in the value of cold canvassing. He devotes no less than 30 per cent of his time to this type of work, and points to his record as justification of this method.

MAY OIL BURNER ADDS TO SALES STAFF

Baltimore, Md.—The May Oil Burner Corporation has recently added two new members to its staff, Millard Bennett and C. J. Cooper, Jr., the latter to assist P. H. Jacobson, district manager in Chicago, and the former to operate in New England, with Boston as headquarters.

Both Mr. Bennett and Mr. Cooper have had extensive experience in merchandising domestic equipment. Mr. Bennett was instrumental in organizing one of the largest electric refrigeration retail outlets in the United States, and was merchandising counsel for one of the large electric refrigerator manufacturers. Mr. Cooper was a sales executive for the Easy Washer Company.

G. N. IRISH JOINS LIQUID COOLER CORP.

Detroit, Mich.—G. N. Irish, formerly connected with the Norge Corporation, is now with the Liquid Cooler Corporation in charge of the Drafting and Designing Department.

Mr. Irish has had several years' experience in refrigeration, beginning back in the days of the Nizer Corporation, later at Kelvinator and Norge.

ARCO COMPANY BUILDING WEST COAST PLANT

Los Angeles, Calif.—The Arco Co. of Cleveland has selected this city as the location for its new paint plant to serve the Western, Latin American and the Oriental trade.

The plant will consist of three brick buildings, with metal trim and concrete floor construction, totaling 16,500 feet of floor space. The factory buildings will include a paint manufacturing plant 100 by 100 feet, a lacquer plant 50 by 100 feet, and a varnish plant 30 by 60 feet. The new plant's output will include the company's complete line of paints, lacquers, varnishes and enamels.

The new factory will be known as the Arco Company, Ltd., of Calif., and will be under the general direction of Howard Wise. Howard Raeney will be general sales manager, and E. B. Hagar, who has been manager of the San Francisco branch, will be made district manager, with headquarters in Los Angeles. In addition to the Los Angeles plant, the company operates factories in Cleveland and in Toronto, Ontario, Canada.

WALKER CO. SUPERVISORS PLAN SPRING ACTIVITIES

Toledo, Ohio.—The sales supervisors of the Eastern Division of the Toledo district of the E. H. Walker Company, wholesale Frigidaire distributors, held a meeting in Fremont, Ohio, March 13. Among the Toledo officials who attended the meeting were A. C. Hunt, assistant general manager, O. W. Gleason, sales manager, R. A. Caylor, service manager, and A. W. (Bill) Taylor, sales promotion manager.

Dale Ervin, Eastern Division Manager, representing the dealers and sales supervisors in his division, spoke at the meeting. Mr. Hunt discussed the method by which finance handling will be improved during the next few months.

Mr. Caylor explained in detail several improvements which have been made upon Frigidaire equipment. The speaker outlined a program of night service schools which will be held throughout the district during the next two months.

A. W. Taylor in his address discussed the commercial direct mail plan by which all dealers can secure commercial direct-mailing at a very moderate cost without the bother of having the detail work necessary. The speaker also explained the newspaper and billboard advertising schedule for this year, and how it will affect sales in each dealer's territory.

O. W. Gleason told the delegates how the Toledo district volume of business from small towns was constantly increasing and just what activity was necessary during the next few months in order to insure a larger volume of business. Mr. Gleason also explained the "reciprocity contest," which the E. H. Walker Co. is conducting. This contest offers special awards to division managers, sales supervisors and all dealers securing a set quota of business.

NEW NORGE UNIT

(Concluded from Page 1, Column 5)

ice-cube compartment. Combined with it is a switch used for starting and stopping the unit.

The cabinets are furnished in four, five and seven cubic foot sizes, and they are sturdy in construction and well insulated. The four-foot size has a bonderized lacquer exterior and a vitreous porcelain interior. The five- and seven-foot sizes have porcelain on both the interior and exterior. The especially designed hardware is of stamped and cast brass, with a finish of chromium over nickel. The design of the door latch permits closing without slamming.

The spacious shelves are of heavy parallel bar construction. They are hot-welded and triple-tinned. A porcelain chill tray for crisping salads and storing foods which must be kept unusually cold is part of the standard equipment of each refrigerator.

YOUNGSTOWN PLANT GETS KELVINATOR COOLERS

Youngstown, Ohio.—The National Business Department of the Kelvinator Corporation concluded a deal with the Youngstown Sheet & Tube Co. here. The contract, which was secured by Ralph D. Lombard, Central States manager of the National Business Department, cooperating with the Halsey-Taylor Co., of Warren, Ohio, calls for 4 water coolers, Models 117-H, 115-G, 119-H and 116-G, respectively, with four Kelvinator A B Units, four A S Units, and five F-11 Units.

This purchase was made after the Youngstown Sheet & Tube Co. had placed the Kelvinator units in their laboratory for thorough test and found them satisfactory.

APARTMENT MEN CONFER AT KELVINATOR FACTORY

Detroit, Mich.—The first Kelvinator Apartment Managers' Conference was held at the factory March 17 with attendance of representatives of distributors from 21 key cities of the country. Three new cabinets, designed to fill the price gap in the new Apartment House Line, were shown and enthusiastically received.

Plans were discussed with general sales executives and the new Sales Promotion Department for operations during the balance of 1930.

Those attending the conference were as follows: L. W. Morris, Kelvinator Georgia Co., Atlanta, Ga.; W. C. Walke, Consolidated Gas, Electric Light & Power Co., Baltimore, Md.; H. A. Dolan, Kelvinator Sales Corp., Boston, Mass.; R. A. Pierce, Kelvinator Buffalo Corp., Buffalo, N. Y.; William T. Reace, Commonwealth Edison Co., Chicago, Ill.; I. H. Goodman, The Julius J. Bantlin Co., Cincinnati, Ohio; A. L. Morrison, Kelvinator Sales Corp., Cleveland, Ohio; A. L. Schluttig, Kelvinator Columbus, Inc., Columbus, Ohio; L. A. Watson, Kelvinator Sales Corp., Detroit; P. W. Fachtman, J. O. Jackson, F. W. Barrett and P. Pratt, Jackson Supply Co., Indianapolis, Ind.; G. N. Paris, Western Kelvinator Co., Kansas City, Mo.; J. P. Hamilton, P. A. Terstegge and T. H. Mason, Stratton-Terstegge Co., Inc., Louisville, Ky.; S. P. Freeman, Stratton-Warren Hardware Co., Memphis, Tenn.; E. Woodruff, Milwaukee Electric Railway & Light Co., Milwaukee, Wis.; Al Heinen and C. P. Moon, Northern States Power Company, Minneapolis, Minn.; G. W. Price, A. H. Karl, Inc., Mt. Vernon, N. Y.; G. A. Marshall, Public Service Gas & Electric Co., Newark, N. J.; F. J. Hughes, Kelvinator Sales Corp., New York City; Maurice Fagan, Kelvinator Philadelphia, Inc., Philadelphia, Pa.; L. R. Woods, Kelvinator St. Louis, Inc., St. Louis, Mo.; M. Johnson, Barber & Ross, Inc., Washington, D. C.

SEATTLE FIRM OPENS NEW COMMERCIAL QUARTERS

Seattle, Wash.—Harper & Meggee, distributors for Copeland, have opened new and enlarged quarters for their commercial department at 2209 Fifth Ave., near Blanchard St. Models for all types of commercial installations are on display here.

The Human Question Involved in Salesmen's Turnover

By T. K. Quinn, Manager Electric Refrigeration Department, General Electric Company

THERE are probably more than 30,000 men and women in this country selling electric refrigerators. The best among them are those who realize that they are pioneering in the field of proper food preservation and spreading the gospel of better health. Those who are able to lose themselves in the cause will profit most. A man who sets out solely to make a success of himself is not likely to do very well. The success of any one human being in a world where there are two billion of us cannot be very important. The purpose must be greater than the man. Lincoln did not make freeing the slaves famous, but freeing the slaves is one of the things that made Lincoln famous. It is usually true that our own personal rewards must be incidental to some greater accomplishment. When a salesman begins to appreciate that the sale of a good electric refrigerator will profit the purchaser very much more than it will himself, or the dealer, or the manufacturer, or all three together, he has made an intelligent start.

Like the salesman who thinks of nothing but his commission, manufacturers, distributors, and dealers who will heartily indorse what I have so far stated, will, nevertheless, insist upon discussing the question of salesmen's turnover wholly from the viewpoint of its heavy cost to them. To be sure, it is very expensive, but this is a short-sighted, unhealthy and selfish policy.

One of the inspiring things about our industry which is enjoying such triumphant development is the opportunity it continually offers to men who may even have failed elsewhere to find themselves in this new progressive field. Unfortunately hundreds of them are being employed and discharged every few days. The turnover rate is excessive.

The failure of a man anywhere is almost always partly the fault of his employer and we must accept our part of the responsibility. Where we do not do everything within our power to make a success of the man, we have committed a serious offense, not only to him and to ourselves, but to society. Repeated failures will eventually drive the spirit out of some of the best men until they may end up on a park bench listening to the grumblings of the discontented. If we deliberately set out to think in terms of helping men and actually do it, the success we want will come automatically as a by-product, just as it comes to the salesmen who can think in terms of benefiting the purchaser.

Let us grasp the opportunity offered to us every day of making what we can of these people who come to us by teaching and thoroughly equipping them for the work before we send them out, and then following them with every possible aid and encouragement up to the point where we may find that it is useless. We shall be amazed to find how few of them will really fail if we do our part. The selfish point is that this policy will pay in the long run, but even if it did not it is at least as great a contribution to society as earning dividends for stockholders.

FRIGIDAIRE SUPERVISORS HOLD DISTRICT MEETINGS

New York, N. Y.—Frigidaire Corporation began a series of district educational supervisor meetings at the Pennsylvania Hotel March 21 and 22. Educational representatives from the Albany, Baltimore, Boston, New Haven, New York, Norfolk, Philadelphia, Pittsburgh, Roanoke, Rochester, Springfield, and Washington districts attended.

A second meeting will be held in Chicago March 28 and 29. At this meeting men from the Chicago, Cincinnati, Cleveland, Columbus, Davenport, Dayton, Denver, Des Moines, Detroit, Flint, Grand Rapids, Indianapolis, Milwaukee, Omaha, Peoria, St. Louis, Sioux City, Toledo, Twin Cities, Buffalo, and Toronto districts will attend.

R. J. Richards, manager of the Frigidaire sales educational department; D. T. Hayward and V. C. Smith will represent the factory organization at these field meetings. Among subjects to be discussed are water cooling, home service work, merchandising methods, sales plans, and educational plans for coming months.

FOUR COMPANIES HAVE LARGE EXHIBITS AT SPRINGFIELD SHOW

Springfield, Mass.—At the Home Progress and Electrical Exposition in the Municipal Auditorium, March 10 to 15, the Springfield branch of Frigidaire Corp., the Electric Device Co., Springfield Kelvinator Sales, Inc., and Charles Rice, Inc., had attractive booths for the Frigidaire, General Electric, Kelvinator and Copeland lines, respectively. Each concern had an opportunity to exhibit in the exposition's model kitchen part of the time. Satisfactory sales are reported, and special measures were taken to develop a large number of leads for future sales.

AYRES SELLS ANOTHER DOZEN

Birmingham, Ala.—Installation of twelve Electrolux machines in the Glen Iris Apartments here is being made by the Birmingham Gas Company. The sale was made under the direction of A. H. Ayres, assistant sales manager of the company, local distributors.

Why do Builders and Architects *Stay Sold on* ELECTROLUX?

WHEN successful builders and architects repeatedly choose Electrolux . . . when they go to the trouble of writing in, telling us of faster rentals, quicker sales, elimination of refrigeration complaints . . . and end by saying that they intend to install Electrolux in every new project . . . you've got the strongest kind of sales arguments with which to go after architects and builders in your community.

Here are a few examples of what we mean:

Mr. Alex. Rodman

Mr. Gustave Kellner, Brooklyn builder, writes: "I've tried other types of automatic refrigeration, but none have so fully satisfied both tenant and buyer demands as Electrolux." Mr. Kellner should know. He has installed Electrolux in his last three apartment houses, and is replacing all other makes with Electrolux in his other buildings. His latest 131-apartment project, equipped with Electrolux, rented completely in two months . . . sold in six months.

Rodman & English, builders of Long Island suburban houses, chose Electrolux for their 314-home development at Hollis, L. I. Every home was sold in eleven months. Then they ordered 135 more Electrolux for their new Addisleigh Homes development.

Mr. Gerald English

Mr. Victor C. Farrar, architect for the Henry Mandel Co., New York City, writes: "Electrolux is the most remarkable automatic refrigeration development of all." And to prove that he means every word of it, he first specified 120 Electrolux for the Tuscany, then 126 Electrolux for the Brittany, then 147 for the Lombardy—three of New York's finest apartment houses.

Mr. Gustave Kellner

An unusual and arresting national advertising campaign is telling architects, builders, owners, and housewives about Electrolux. Every day the demand increases for this remarkable refrigerator that requires only a tiny gas flame and a small flow of water to supply constant refrigerating cold and plenty of pure sparkling ice cubes. A few desirable franchises are still available. For information, write, wire, or phone Electrolux Refrigerator Sales, Inc., Evansville, Indiana.

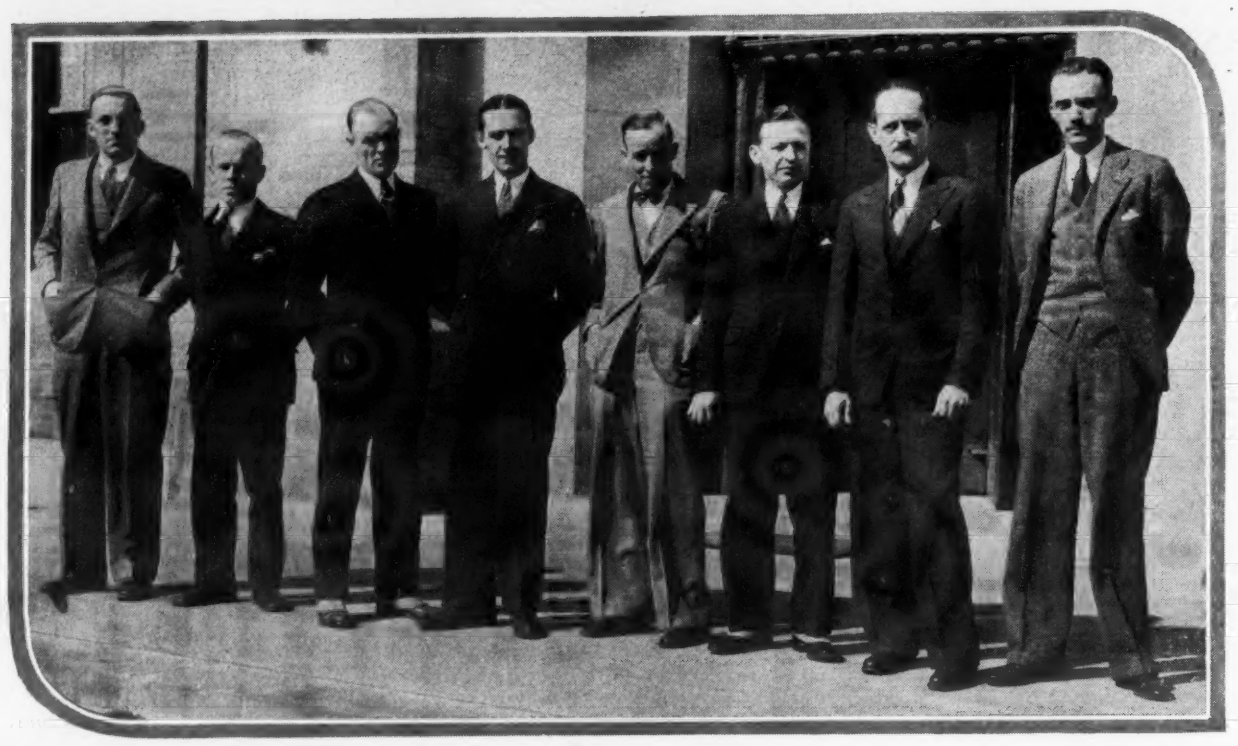
Mr. Victor C. Farrar

ELECTROLUX

THE *Gas* REFRIGERATOR

A tiny gas flame takes the place of all moving parts

Promotion of Sales is Their Latest Job in Kelvinator Organization



Detroit, Mich. — Kelvinator Corporation has organized a new Sales Promotion Department, which will be in charge of Vance C. Woodcox, formerly domestic sales manager. Domestic sales have merged with the new group.

The personnel of the new department at duty at the factory is pictured here making themselves acquainted with the photographer. From left to right—T. S. Edwards, commercial; John S. Garceau, contests and International Sales Club; George E. Wagoner, wholesale; Vance C: Woodcox, manager; Richard Owen, field representative; V. J. McIntyre, apartments and builders; H. L. Hull, water cooling, and G. A. Wilcock, domestic.

In the field this organization has the following representatives: R. I. Eshman, Northwest, Seattle; S. A. Kelsey, New England, New Haven; W. C. Stepheson, Central West, Chicago; E. H. Manier, Philadelphia; J. B. Loomis, Northwest, Minneapolis; C. B. Jones, Southwest, Kansas City; S. R. Kemp, South Central, Louisville; R. E. Hunter, Texas, Dallas; T. A. Jenkins, Ohio and Michigan, Detroit; L. R. Saal, Charlotte, N. C., and Charles Smith, Raleigh, N. C.

Smart Dealer Knows How To Keep Inventory Clean

By Frank W. Gray

THE stock market operator must learn to take a loss before he can be called an experienced trader. Merchants, likewise, must learn to take losses before their businesses can really be called seasoned. The writer has been impressed with the number of electric refrigeration dealers who could not, or would not, keep their inventories clean. In almost every refrigeration agency one finds a collection of antiques, either in a corner of the show room, or in the warehouse. Old domestic refrigerators of vintages of several years back, compressors which have never been overhauled and put back into service, leaky valves, various discarded cooling units, and miscellaneous accumulations of copper and brass, all of which represent money—more often than not, *a good deal of money.*

The natural tendency of salesmen is to ignore the "boneyard" inventory, and to sell new and up to date material. The natural tendency of the service men is to push it into the background. And with this atmosphere of "it can't be sold" the owner or manager is often tempted to follow the line of least resistance and content himself with hoping that some day this museum of antiques will sell itself. His brand new models don't sell themselves, but somehow he has faith that the old ones will.

One of the redeeming features of the electric refrigeration business is that change of models is not so rapid or drastic as to force obsolescence, and the nature of electric refrigeration equipment is not such that it rapidly depreciates. Refrigerator cabinets, even though they be older models, are still salable and usable if a little effort is put behind their sale. A little steel wool, a bottle of carbon tetrachloride, a can of paint, some new oil, and a little well applied elbow grease will do wonders for discarded refrigerators or mechanisms.

The gist of the out-of-date inventory situation is simply that the average dealer likes to carry such material on his books at cost valuation. He doesn't spend the time to put it into shape nor the effort to sell it, and he hates to bring himself face to face with a loss. Meantime the white elephants in the "boneyard" continue to gather dust, and to freeze nothing but operating capital which, if realesd, even at a discount of 50 per cent, might easily earn the original investment in six months if put into active turnover.

The writer recently found an instance of this situation in Seattle. Calling on a prominent electrical dealer in that city he discovered six or seven electric refrigerators of somewhat obsolete models, reposing in the rear of a handsome show room. In answer to his questions, the dealer disclosed the information that he had a carload more of these boxes in the warehouse, and had had them there for nearly two years. The total investment in this inventory exceeded $7,000.

The dealer was handling so many other lines of merchandise that it was clearly an instance of having "bitten off more than he could chew." But the fact remains that this investment had been idle for two years, that the material was depreciating more in value every day, while no perceptible effort was being made to sell it.

The writer suggested to this dealer that he polish up the cabinets in the rear of the room, and put them into operation; that he advertise them at a good discount, and that he stimulate some sales effort among his employees by holding a "white elephant" sales meeting every Friday night at which time ways and means of disposing of them could be discussed.

The dealer took the suggestion, and a recent letter from him indicates that he has sold about half of this dead stock and is still going strong.

The above case is an extreme one. The average case is more difficult to emphasize, owing to the fact that the average dead inventory investment is usually smaller, and the business seems to rock along in spite of a thousand or two invested in obsolete and neglected stock.

The disposition of old merchandise, however, should be considered one of the active problems of sales administration. The condition of the inventory should be discussed at every sales meeting. The service department should be required to keep such material in salable shape. The service men frequently are not busy and could easily handle this work. And the dealer should reconcile himself to taking a reasonable loss on this material, and to indicate the loss in his resale prices and in his inventory valuation.

The first step in disposing of dead inventory is, of course, to display it. Old refrigerators need not be placed in the show windows, but they can be cleaned up, refinished if necessary, and be displayed to advantage in the rear of the store.

They should be clearly marked with bargain prices. It is a waste of time to orate to salesmen on selling such material at regular list prices. They can't do it, they won't do it, they don't do it! Make the veterans bargains—real bargains.

Cleverly written ads in the classified columns of newspapers will often bring purchasers for such material. Another scheme that has proved successful in some cities is to have the salesmen sell them direct from their own homes, where the display of new merchandise will not detract the attention of the purchaser. Bargain hunters are less wary of a private individual selling at a sacrifice than a dealer.

The sales manager should furnish every salesman with a card listing the slow moving inventory, together with discounted prices on same. These cards should be reissued at each sales meeting so that the progress of sales is always evident. Another good idea is to allow a special commission bonus on older models sold.

Most electric refrigeration dealers plan to make a gross of from 25 per cent to 35 per cent on their sales volume each month. How near they come to making this gross on their invested capital is determined by how careful they were with their buying and their turnover. If a dealer has $1,000 invested in out-of-date material (and this is about the average for the small dealer) and he disposes of it at a sacrifice of $500, that $500 liquid capital should repay the loss if invested in new stock that is turning rapidly.

In estimating business profits and their relation to turnover, the writer likes to think of the cigarette business. Many tobacco dealers make less than 10 per cent gross on their cigarette sales. And their cost of doing business may be 25 per cent. But they clear their stock nearly every day, so that their monthly gross profit is more nearly 100 per cent than 10 per cent. The unit profit should be the determining factor in business only when it is impossible to turn goods rapidly. Large and successful merchandising firms always figure on the turnover to make up their gross. Figuring on this basis, the electric refrigeration dealer simply cannot afford to maintain a "boneyard."

Figure it out for yourself. And get rid of those "white elephants!"

HARSHAW MOVES OFFICES

Cleveland, Ohio.—The Harshaw Chemical Co. has moved its executive and sales office from the Hanna Bldg. to 1945 East 97th St., here.

ELIMINATE PATCHWORK

with

Balsam-Wool Sealed Slabs

highly efficient insulation

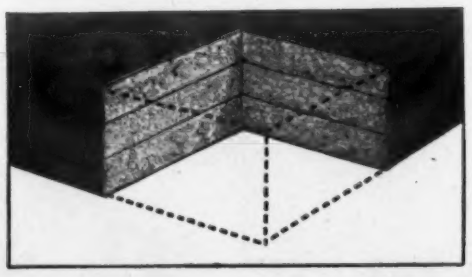
Balsam-Wool Sealed Slabs made to any length, breadth, thickness—are ready to put quickly in place. They eliminate patchwork—and the hazards of improper sealing. The ideal insulation for mechanical refrigerators!

Flexible enough to fit snug! Rigid enough for easy handling. Once in place they are there to stay.

In addition to their high insulating efficiency, labor saving, and durability, Balsam-Wool Sealed Slabs are carefully sealed against moisture, and are sanitary, vermin-proof, odorless—and economical.

Their average thermal conductivity does not exceed 6.0 B. t. u. per square foot, per inch thickness, per one degree Fahrenheit difference in temperature in 24 hours.

If you haven't already examined one of these *perfected* Balsam-Wool Sealed Slabs—let us send you one *free.* Write to our nearest sales office.



Note the firm edge extending completely around the Balsam-Wool Sealed Slabs. This enables workmen to seal these semi-rigid slabs to refrigerator frames as is usually done with rigid insulation. The close-up on the left, shows the construction of Balsam-Wool Sealed Slabs

A guaranteed Weyerhaeuser product

WOOD CONVERSION COMPANY

Mills at Cloquet, Minnesota

Industrial Sales Offices

Chicago, 360 No. Michigan Ave.

New York, 3107 Chanin Bldg. Detroit, 3084 West Grand Blvd.

Manufacturers of Balsam-Wool Insulation for Domestic Refrigerators, Motor Buses and Airplanes; Balsam-Wool Refrigerator Car Insulation and Steel Passenger Car Insulation; Balsam-Wool Standard Building Insulation and Nu-Wood Insulating Board

The leading refrigerator manufacturers are using our Double Seal and special gaskets made for their requirements. We will be glad to figure on your problem.

Specialists in refrigeration gasket.

BOSLEY'S Since 1869 The VERY BEST QUALITY SERVICE WEATHER STRIP

The D.W. Bosley Company

906 Marquette Bldg.

Chicago, Ill.

MILWAUKEE CODE LINGERS IN HANDS OF COMMITTEE

Milwaukee, Wis.—After six months of work, an emergency ordinance to regulate domestic refrigerators is yet to be drafted into final form by a special committee for presentation to the city council.

"The ordinance under consideration is intended only as a preliminary measure to give the building inspector and the health commissioner the power to regulate refrigerators until a permanent ordinance can be drafted," explained T. L. Rose, architect, who presided.

The proposed ordinance classifies refrigerators as to size and the amount of refrigerant used, and provides for placing "detector" gas in machines using an odorless refrigerant.

Dr. William McNally, toxicologist of the Rush Medical College at Chicago, suggested placing placards on each refrigerator so that in case of accident the authorities would know what type of gas they are dealing with.

According to Dr. McNally, accidents are due to what he described as "bootleg" refrigerator equipment. The leaks have been caused, he said by cheap and faulty materials and loose connections made by "fly-by-night" companies.

A public hearing for consideration of the proposed ordinance to govern the installation of mechanical refrigerators in apartment buildings was held here on March 12 in the common council chambers. Reduction from twenty to seven pounds as the maximum amount of refrigerant in domestic one-unit systems was recommended to the committee.

TRUPAR'S 1930 SALES EXCEED ALL EXPECTATIONS

Dayton, Ohio.—Sales for the first two months of 1930 by the Trupar Manufacturing Company, makers of Trupar electric refrigerators, are exceeding the highest expectation of officials of the company, it was made known March 15.

Orders received at the factory indicate that production schedules will be increased for some time. I. G. Lindsay, Trupar sales manager, declared that refrigeration sales for January and February were especially gratifying. Trupar sales are considerably ahead of the same period of 1929.

Trupar engineers are constantly at work on improvements, while the manufacturing divisions are busy with the production of the electric refrigerator. Sales operations are being extended rapidly to all the larger cities of the country.

KELVINATOR AUGMENTS NATIONAL AD DRIVE

Detroit, Mich.—The Kelvinator Corporation has announced to its distributor and dealer organization an enlargement of its national advertising program, the chief features of which will be three double-page spreads in the *Saturday Evening Post*. These will appear in April and May. The May advertisements will be in colors. The special features of the Kelvinator are to be strongly stressed in pictures and copy.

HOLBROOK REFRIGERATION TO BE SOLD IN FRESNO

Fresno, Calif.—Holbrook, Merrill & Stetson Manufacturing Co., 903 N. Main St., Los Angeles, manufacturers of Holbrook electric refrigeration, has opened a branch at 1940 Toulumne St., here, under the management of J. D. Grant, formerly of Los Angeles.

At present salesrooms and office will be maintained at 1940 Toulumne St. As soon as it is possible to secure space and equipment there will be maintained a fully equipped plant for the local manufacturing of low side and other special equipment.

Dealers are being established in the outlying towns. It is intended to cover the entire San Joaquin valley from the Fresno branch, thus giving dealers a one-day delivery service on equipment.

B. F. Carmichael is specializing on dairy cooling equipment for dairies in the San Joaquin valley. Mr. Brown and Mr. Wilson are salesmen covering the commercial and apartment house fields.

Holbrook, Merrill and Stetson is a large company established a number of years ago on the west coast in the manufacturing business. It maintains factory branches at San rFancisco, Sacramento and Fresno.

AUTO DISTRIBUTORS SIGN UP WITH KELVINATOR

New York, N. Y.—In the past few weeks the Kelvinator branch has signed up several automobile distributors and a large radio dealer to handle Kelvinator refrigeration. G. Golliher, wholesale representative of the Kelvinator Sales Corp., signed up these companies.

The E. T. Shortt Motor Co., Packard distributors for Staten Island, N. Y., have been appointed Kelvinator dealers for the north shore territory of the Island. This company has been active in the automotive field for a number of years and anticipates a large volume of refrigeration sales. Kelvinator will be represented in the south shore district of Staten Island by the Detroit Garage, which distributes the Auburn motor car there. Mr. Detroit is well known in the New York territory, having served on the metropolitan detective force for a number of years.

In Suffern, N. Y., the Double S. & S. Radio Service has acquired the Kelvinator franchise for that city.

STRATTON & TERSTEGGE HOLD CONVENTION

Louisville, Ky.—An enthusiastic dealers' convention was recently held by Stratton & Terstegge, Louisville, Ky., Kelvinator distributors. Manager P. A. Terstegge was toastmaster. Stratton & Terstegge's sales manager, Robert Montgomery, talked on "Things You've Never Thought About." Kelvinator General Sales Manager Sayre delivered an address entitled "The Picture from the Factory."

Kelvinator Advertising Director Earl Lines' subject was "How the Factory Is Helping You." Kelvinator Reau Kemp discussed "The Real Selling Features of Kelvinator." District Manager S. D. Camper spoke on "What the Dealer Owes the Distributor." Walter Moss, Stratton & Terstegge's district manager, spoke on "The Value of the Lines." Two bands furnished lively music and entertainment.

ABERDEEN DEALER OPENS NEW STORE

Aberdeen, Wash.—A new store has been opened by the Modern Utilities Company at 208 S. Broadway. This company represents Frigidaire in Gray's Harbor County.

L. C. Ireland, manager of the new company, has been for several years the sales manager of the Delco Light Co. at Seattle, and more recently was field supervisor of the Frigidaire Corporation. H. C. Palmer and G. K. Stephenson have been transferred from Chehalis, Wash., to head, respectively, the Frigidaire and the Oil-O-Matic departments of the company, while the Delco Light and pump sales, also a part of the merchandising and stock of the new company will be under the direction of Roy Huggett, who has arrived from Olympia to assume his new duties.

MADRID FIRM REPORTS 42 SALES IN 10 MONTHS

Madrid, Spain—A modern message from Garcia is that received by the H. M. Robins Co., export distributors for Copeland Products, Inc., from Gumersindo Garcia, Copeland distributor, Madrid, in which he reports 42 Copeland commercial installations there in ten months, an average of one a week. Garcia reports Spain, after much hesitancy, now seems to be taking readily to electric refrigeration, and that the future of the industry there appears bright.

New Zealand Distributors Keep Servel Name Before Public in Auckland

THAT every possible method of advertising their products should be used, is believed by Bond & Bond, Servel distributors in Auckland, New Zealand. The photograph shows a neatly painted service truck of Bond & Bond, which travels on the streets of Auckland. It tells the passersby of the clean and sanitary features of the products they are selling, and at the same time carries the Servel Seal of Sanitation, which is becoming more prominent every day in Auckland food stores all over town.

For example, the Auckland Meat Company conducts a chain of some 30 stores in Auckland, of which 25 are now being equipped throughout with Servel systems.

ILLINOIS CABINETS *for the* NEW AGE

IT IS HERE—The Machine Age. Like it or not, the public demands more luxury and more time for play. Give it to them with ILLINOIS—AUTOMATIC CABINETS. Here is a full sized line of cabinets that meets every exactness of the times. First of all, an outstanding *beauty* to dignify the home; next, a *sound construction* to guarantee long years of usefulness; *DRY ZERO* insulation for increased efficiency and economy; extra *capacity* for more storage; satin-silvered hardware and heavy gaskets that hold the doors in tightness. In fact, every known MODERN IMPROVEMENT.

Will you please write us for more detailed specifications and description?

ILLINOIS REFRIGERATOR COMPANY

"Fine Cabinets for 40 Years"

MORRISON - ILLINOIS

Fulco

REFRIGERATOR COVERS

"FULCO" covers are used by those dealers who realize the importance of making deliveries in perfect condition—without scratches or broken enamel. For they know that complaints mean dissatisfied customers and loss of business.

"FULCO" covers are a real service feature that helps sales and holds trade.

Substantially constructed, heavily padded, box-shaped, providing perfect protection.

Give us the dimensions of your refrigerators, and let us quote special prices on your individual needs. Write our nearest house.

Fulton Bag & Cotton Mills

manufacturers Since 1870

ATLANTA · NEW ORLEANS · DALLAS · ST. LOUIS
MINNEAPOLIS · BROOKLYN · KAN. CITY, KAN

ELECTRIC REFRIGERATION NEWS

The Business Newspaper of the Refrigeration Industry

Published Every Two Weeks by

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The Service Man's Place

WHERE does the service man fit into the scheme of things in a well regulated organization manufacturing refrigerators? The big group of men who discussed service and service problems at the recent meeting of the Detroit Section of the American Society of Refrigerating Engineers, reported elsewhere in this issue of the NEWS, went away with what, for some of them at least, was a new conception of the service man's place in a manufacturing organization.

"Service belongs beside Sales" was the statement made by several of the speakers, and they produced able reasoning in support of that view. One man pointed out the fact that the service man and the salesman are the only two representatives of the company who are directly in contact with the public; who speak for the company to the man, or more often the woman, who is using the refrigerator. And of the two, the service man has the harder assignment. He can not pick his prospects, can not arrange his schedule so as to see them only when they are in good humor. On the contrary, he usually has a dissatisfied person on his hands; he must be a diplomat as well as a mechanic or he will do more harm to his company by his speech and demeanor, than he possibly can do good by displaying the most skillful technique while operating upon the ailing refrigerator.

There are other points of difference between the salesman and the service man, and in most cases the salesman gets the best of the bargain. The salesman can *talk* about the refrigerator's performance; the service man has to *prove* that it will perform as advertised. "Deeds not words" is his slogan. It is a slogan that he lives up to. If he doesn't, he loses his job.

The good salesman finds that he has a liberal employer back of him, because the average executive realizes that sales expense is justified by the results obtained. How about the service man? Is the full value of the results he obtains generally recognized? Is he regarded as an asset or as a necessary evil?

The consensus of opinion at the Detroit A. S. R. E. meeting seemed to be that the good service man is an asset, whose service to the company for which he works is something more than the title he bears.

* * *

Broadening Out

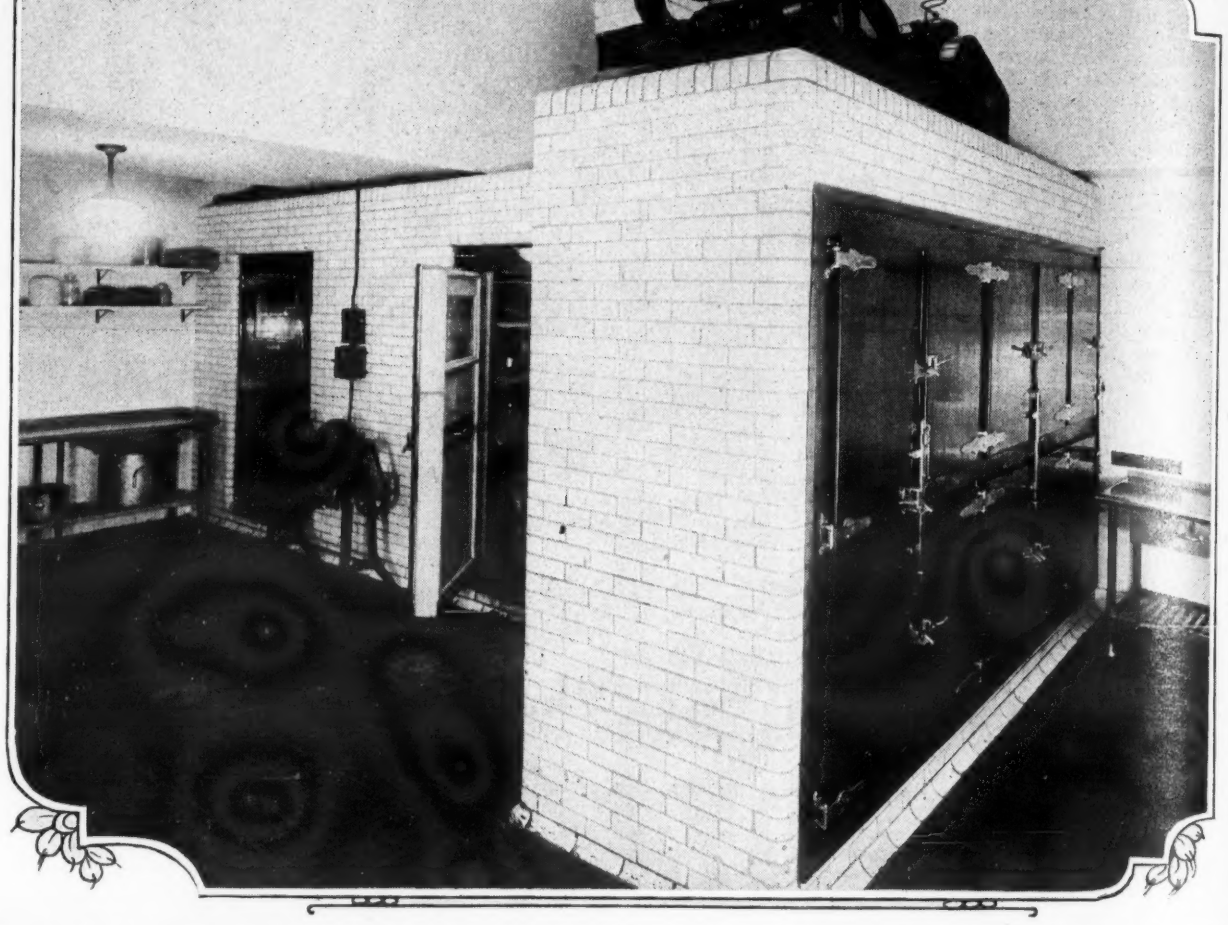
ACCORDING to the laws of physics, intense cold should cause contraction of bodies to which it is applied. Somehow or other that law seems to have been suspended in the case of ELECTRIC REFRIGERATION NEWS. The quick freezing of foods, with its accompanying excursions into the realms of low temperatures, has caused the NEWS to expand instead of to contract.

The expansion has taken the form of a Refrigerated Food Section, which contains just the sort of material which its name implies. As quick-frozen food is occupying so much of the refrigeration industry's attention just at this time, that subject dominates the current issue of the new section. Whether or not it will continue to do so is problematical. In comparison with the total amount of food distributed and consumed in the United States, the amount that can be handled by quick freezing is so small, that for many years to come, the cooling, rather than the freezing, of foods will demand its full share of attention.

By the same token, manufacturers of equipment for the cooling of food have no reason to fear the advent of quick freezing. Display cases of the present type will be sold for the next few centuries according to the present outlook. That ought to be long enough for the average manufacturer.

Just as quick freezing has caused the NEWS to expand, so is it certain to expand, rather than contract, the business of the alert maker of refrigerating equipment. New fields to conquer spread themselves before him. The experience that he has gained in the past will be of infinite help in the solving of the problems which quick freezing brings in its train. He is sitting on top of the world, a cold spot perhaps, but just the place for a refrigerator manufacturer anxious to unfold the mysteries of quick freezing.

Group of Small Machines Operate Refrigerators in Employees' Restaurant



New York, N. Y.—The New York office of Servel Sales, Inc., has just recently completed an electric refrigeration installation for the restaurant of the Consolidated Gas Company, New York City. The job consists of 14 Servel machines, offering approximately 7,000-lb. of ice-melting effect per 16 hours' running time.

This installation is one in which the use of small machines are expected to show a decided superiority over the central plant system. Servel equipment operates not only the usual type of meat refrigerators, order boxes, pastry refrigerators, etc., but also an ice storage box, a large storage room, and a 600-lb. ice maker.

CONTROL OF HUMIDITY IMPORTANT TO HEALTH

THE leading editorial in the February 12 issue of the NEWS contained the following sentence: "Humidity, how much or how little dampness is desirable or necessary, presents a problem about which none too much is known, not only in the field of refrigeration, but in other human activities."

Some of the things that are known, some of the information that has been acquired by painstaking research, was told to a recent meeting of the American Institute of Mining and Metallurgical Engineers by Dr. William John McConnell of the Metropolitan Life Insurance Company. Dr. McConnell's remarks are reported by Time as follows:

"The best *general* conditions are: temperature range between 40° F. and 75° F.; humidity 60. Because individuals respond with varying ease to changes of humidity and temperature, the *individual optimum* is best indicated by his pulse rate. The nearer to normal his pulse goes the more efficient he is. The normal pulse rate for men is 68 to 75 a minute.

"Dr. Connell reached these conclusions with engineering finesse. He placed men and women in a special cork-lined heat chamber built by the U. S. Bureau of Mines and operated jointly with the American Society of Heating & Ventilating Engineers. While the specimens rested and worked in still and moving air he made observations:

"A person resting in still, humid air is comfortable until the temperature reaches 90° F.; a light breeze lets him stay so until 95°. However, if he is working his muscles he feels discomfort at 80°. At 100° a man can do four times as much work if the air is dry (humidity 30) than if it were saturated (humidity 100). With humidity at the ordinary 60, the subjects did five times more work at 90° than at 120°.

"Warm blooded animals accommodate themselves efficiently to changes in temperature. They are continually manufacturing heat themselves and getting rid of it. Thus they maintain normal temperatures. The smaller the animal the higher is likely to be its body temperature. Temperature of a mouse is 105.8°, rabbit 102.0°, dog 100.0° to 102.0°, man 98.6°, horse 96.8° to 98.6°. Children are about one degree warmer than adults.

"Dissipation of the body manufactured heat depends on the surroundings. The drier the air the more moisture-bound heat it can absorb. The faster the air moves the faster can it carry heat from the body. But if the air is hot, humid and still, the body must struggle to throw off heat. The harder it struggles, the harder the heart must work. The pulse rate indicates the heart efforts, and thus the body efforts. High pulse rate is an index of unwise, inefficient over-exertion. Dr. McConnell found that when his subjects in the cork-lined test room developed a pulse of 135 a minute, they complained of discomfort. Their heads ached, their hearts palpitated. A metallic taste came into their mouths. They could speak only with effort. At 160 pulses a minute they felt as though they were 'floating on air' and were at the verge of heat stroke. Dr. McConnell endangered them no further.

"The significance of his observations meant to his engineer audience that wise employers should keep their work-rooms at comfortable temperature and humidity by means of artificial aids—radiators, pans of water, fans, ducts of washed air."

That last sentence has real significance for the refrigeration industry. The artificial cooling of buildings is a field in which much remains to be done, and in which the possibilities are almost limitless. Some manufacturers already have seen their opportunity and are making room coolers and other equipment for modifying the weather conditions within the walls of the home.

EINSTEIN REFRIGERATOR IS NOTHING BUT RUMOR

1128 Clay Ave.,
New York, N. Y.,

ELECTRIC REFRIGERATION NEWS,
Detroit, Michigan.

In your issue of November 20, 1929, page 18, you published a newspaper report to the effect that Prof. Einstein of Berlin had invented a remarkably efficient household refrigerator which was to be sold at about one-fifth of the price of equivalent standard electric refrigerators.

A correction of the above notice appeared in Zeitschrift fuer Eis and Kalelte–Industrie, Vienna, November, 1929, page 127, as follows:

A direct inquiry by this organ of the Austrian Refrigeration Society to Prof. Einstein was referred by him to Associate Professor Dr. Leo Szillard, Berlin University, Prinz Regenten Strasse 95, who replied under date of November 8, 1929, that the press reports cited were far from the truth. However, that there was under consideration a domestic electric refrigerating machine whose several special features are to be patented in a number of European countries by the General Electric Co., of Berlin. Also, that the machine was still in the experimental state and that at this date (Nov., 1929) nothing whatever could safely be predicted regarding its technical or commercial success. Also that correct information would be broadcast as soon as facts are available.

CHARLES H. HERTER.

ELECTRIC REFRIGERATION APPEALS TO JAPANESE

Cleveland, Ohio.—Food merchants in Japan are awakening to the necessity of mechanical refrigeration in their stores, according to Y. Shimidju, general sales manager of the Tokio Electric Company, which is the general distributing agency for General Electric refrigerators in the land of cherry blossoms.

Mr. Shimidju has just paid an extended visit to Cleveland, visiting the general headquarters of the Electric Refrigeration Department of the General Electric Company, and Nela Park, where he inspected new lighting equipment.

"Our company, upon my return, will organize a separate sales department for General Electric refrigerators," he said. "I intend to place forty salesmen at work on refrigerators in Tokio alone.

"I believe the commercial field offers the most fertile market at this time, as merchants first must learn the value of proper food preservation. However, we have sold a number of domestic models.

"We have a peculiar situation in Japan—peculiar as far as the United States is concerned. There, 90 per cent of the homes are wired for electricity, but a great number of them have only one outlet and that, of course, is for lighting. We have the job of inducing home owners to put in more outlets so that they can use more appliances.

"We started selling refrigerators in 1928 and during 1929 we showed a 400 per cent increase over the initial year's business. We expect this year, of course, to be far better than last."

CORRECTING AN ERROR REGARDING SILVERICE

IN describing Silverice balls in the section devoted to related merchandise in the March 12 issue, the NEWS inadvertently omitted the word "not" in one of the sentences. Thus the meaning of this sentence was changed.

The sentence should have read as follows: "The water inside the small metal shell cannot escape and dilute the beverage." Omission of the negative made this statement contrary to the general principle and usefulness of the product. The water is sealed within the tiny shell and it is impossible for it to escape into the beverage. This error is greatly regretted by the NEWS.

Silverice balls are used for cooling beverages of all kinds. The balls can be placed in the freezing trays of the refrigerator and there acquire sufficient chill to cool a considerable quantity of liquid.

FOREIGN SHIPMENTS OF ELECTRIC REFRIGERATORS

January Exports Reported by Bureau of Foreign and Domestic Commerce

	Electric Household Refrigerators		Electric Commercial Refrigerators Up to 1 Ton	
	No.	Val.	No.	Val.
Austria	15	$ 1,699	4	$ 1,775
Belgium	168	24,406	15	2,448
Czechoslovakia	10	642	1	527
Finland	5	1,053	1	108
France	12	2,346	252	20,785
Gibraltar	1	175	...	.....
Greece	3	629	...	.....
Irish Free State	2	190	...	.....
Italy	11	1,819	...	.....
Netherlands	26	2,284	38	7,613
Norway	1	190	...	.....
Poland and Danzig	..	....	1	274
Portugal	5	1,078	1	417
Soviet Russia in Europe	9	2,145	8	1,193
Spain	59	17,721	3	558
Sweden	2	333	...	.....
United Kingdom	1,035	147,999	204	29,452
Canada	91	11,407	192	32,770
Costa Rica	5	1,136	1	531
Guatemala	3	633	7	1,154
Honduras	6	1,386	...	.....
Panama	33	4,563	18	5,619
Salvador	6	1,106	...	.....
Mexico	21	4,654	...	.....
Bermudas	22	4,304	2	358
Barbados	3	702	...	.....
Jamaica	..	....	1	345
Other British West Indies	1	293	1	315
Cuba	47	9,558	2	470
Dominican Republic	3	649	...	.....
Netherland West Indies	14	2,209	...	.....
Haiti, Republic of	4	1,008	...	.....
Argentina	265	40,458	21	5,454
Brazil	3	324	45	10,649
Chile	36	6,325	3	1,101
Colombia	38	6,585	...	.....
Peru	25	3,966	65	11,544
Uruguay	128	22,794	43	5,445
Venezuela	134	25,722	10	2,700
Arabia	1	438	...	.....
British India	893	137,104	22	3,652
British Malaya	32	4,371	13	3,122
Ceylon	51	5,813	...	.....
China	51	11,755	1	248
Java and Madura	27	5,078	...	.....
Other Netherland East Indies	..	....	2	393
French Indo-China	68	10,771	...	.....
Japan	129	22,024	...	.....
Philippine Islands	52	11,270	...	.....
Turkey	20	3,272	...	.....
Australia	400	66,204	7	1,062
British Oceania	1	354	...	.....
New Zealand	2	505	...	.....
British East Africa	29	4,425	...	.....
Union of South Africa	202	32,005	1	254
Gold Coast	6	871	...	.....
Egypt	70	8,090	...	.....
Algeria and Tunisia	13	2,061	9	1,174
Morocco	24	3,534	...	.....
Other Portuguese Africa	1	121	...	.....
Total	4,324	$684,557	994	$153,510
Shipments to Hawaii	18	4,586	8	3,598
Porto Rico	23	4,417	2	630

	Thermodynamic Refrigerators	
	No.	Val.
Argentina ... 117, Spain. ..	....	14 $ 1,266

HE GETS PROSPECTS BY WATCHING FOR ICE CARDS

Milwaukee, Wis.—One of the successful refrigerator salesmen, employed by a large distributor here, says his method of securing prospects for mechanical refrigerators is as follows: "I drive slowly through the best residential districts and wherever I see an ice card in a window of a respectable appearing home, I take down the address. After having secured fifteen or twenty, which does not take me very long, I repair to the office and get out the city directory. Therein I find the names of the occupants of the homes where ice cards were displayed.

"I now make a list on which is the name of the occupants of the homes and the business in which the man of the house is engaged. Forthwith I jump in my car and begin to call on the prospects, not, however, early in the morning. I give the future customers time to become wide awake, for it is a well known fact that folks of the better class do not arise early, and it is seldom before ten-thirty or eleven o'clock before they can be seen.

"If the ice card which I have seen in the home window happens to be displayed, I pass up that house. I want the customer to feel that I have some unusual method for securing the name. They often ask how I know that they have no mechanical refrigerator, and I tell them or hint that perhaps a friend has told me. This I could not do if the ice card were in sight. If the card is displayed, I usually wait a day or a day and a half before I call, because by this time the ice has usually melted and more need is felt for a better method of refrigerating. I have secured many orders with my method and am going to continue to use it in the future."

It must be explained that the Milwaukee city directory has an added section in which streets are listed in alphabetical order. Each home on each street is listed according to its house number, with the name of the occupant following. Example:

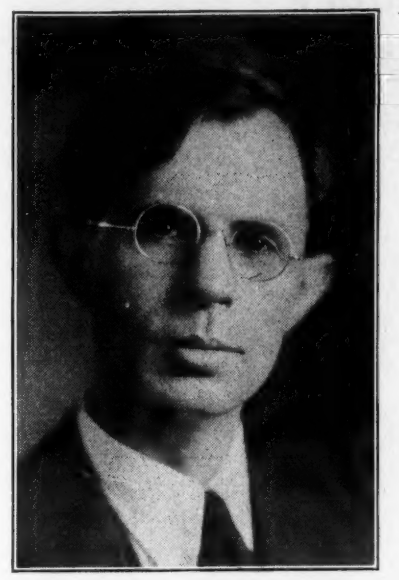
Albion St. House number 365 Occupant Walter Hardtke

Thus it is a simple matter to find the name of the occupant of any home in the city by looking up the number in the city directory.

PITTSFIELD ELECTRIC CO. TO HAVE NEW SHOWROOM

Pittsfield, Mass.—The Pittsfield Electric Co. is making extensive alterations in its main establishment on Eagle St., which include the fitting up of a display room with all commercial models of General Electric refrigerators. An exhibition of the domestic line will be made, as heretofore, at the company's large appliance store at 175 North St.

They Assume New Duties With Frigidaire



Dayton, Ohio.—R. L. Lee has been appointed assistant sales manager of Frigidaire Corporation in charge of water cooling activities. For a number of years he has been sales promotion manager for the corporation. He has been with the organization since the organization of its predecessor, the Delco-Light Company, where he started in the engineering division.

J. J. Nance, formerly assistant to Mr. Lee has been appointed to succeed him as sales promotion manager. Mr. Nance joined the organization a number of years ago, beginning in the sales education department.

Left:
R. L. Lee
Assistant Sales Manager

Right:
J. J. Nance
Sales Promotion Manager

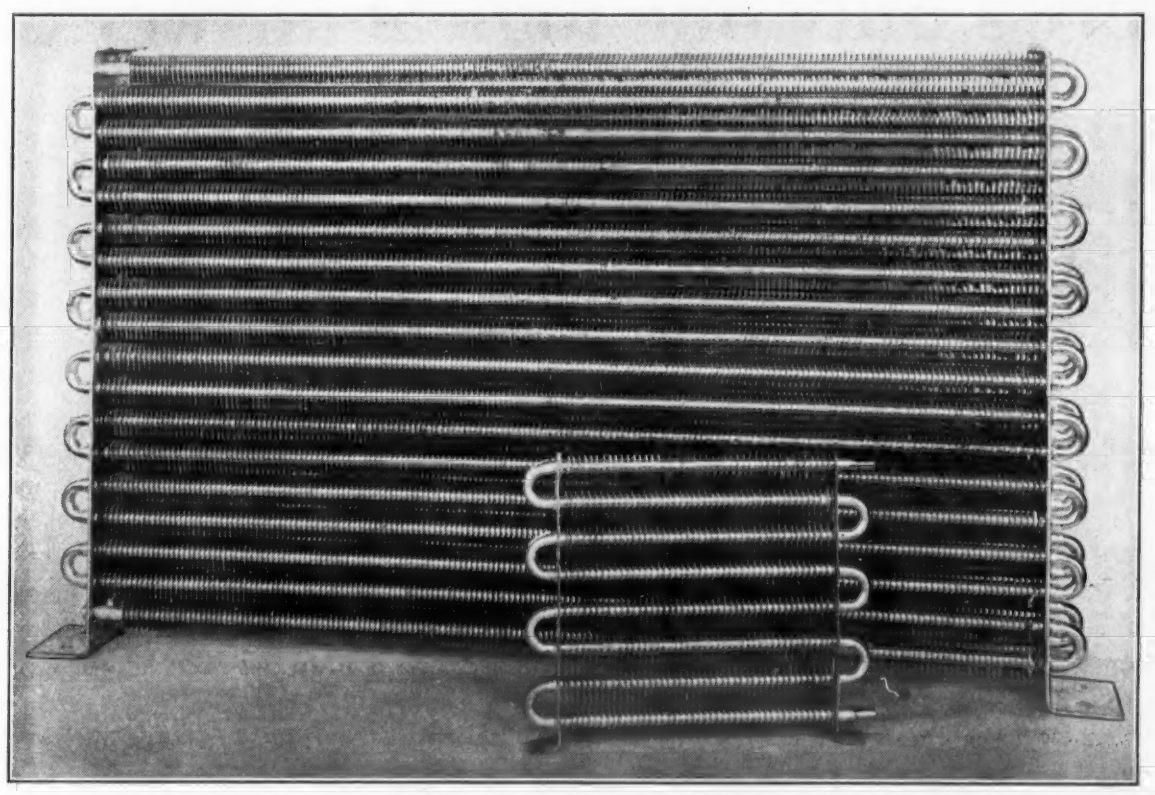
A partial list of REFRIGERATORS in which BUSH CONDENSERS are USED

Bryant
Calectro Frost
Champion
Chilrite
Copeland
Electro-KOLD
Fisher (Canada)
Freezel
Ice Berg
Icelect
Kelvinator
Kulair
Parker
Universal Cooler
Warner
Williams Ice-O-Matic
Zerozone

▼

WRITE US about YOUR NEEDS

BUSH CONDENSERS



SEAMLESS COPPER TUBES
INDIVIDUAL FINS
MAXIMUM EFFICIENCY

«-»

The BUSH MFG. CO.
HARTFORD, CONN.

«-»

W. H. MARK HANNA
6-247 GENERAL MOTORS BLDG., DETROIT, MICH.

They Handle Kelvinator Service Problems in Kansas Power Co. Territory

AVERY business-like service school was held in February by the Kansas Electric Power Co., at Emporia, Kansas. The men shown in the picture are, reading from left to right, as fololws: L. E. Seelinger, Council Grove; H. D. Reinken, Lawrence; C. W. Barron, Parsons; B. S. Lord, Leavenworth; J. E. Barnes, Parsons; C. F. Miles, Madison; A. M. MacLennan, C. Gardner, Bonner Springs; H. R. Lawman, Severy; R. O. Fennington and O. F. Perry, both from Emporia. All these boys are employed by the Kansas Electric Power Company.

Kelvinator during the past few months has been holding service schools in all sections of the country. Dealers and service men have manifested unusual interest in the schools and large attendances have been reported in many cities and towns. Problems that are likely to confront the service man in both domestic and commercial installations have been studied at these meetings, where the attendants remove their coats and plunge right into work. The group pictured here has been considering the Iso-Thermic feature which Kelvinator announced last November.

What Insulation?

There's only one logical answer . . .

CORKBOARD!

WHEN thoughtful customers ask: "What insulation protects this refrigerator?" it's intensely satisfactory to be able to say: "Corkboard!"

Your answer means that you are selling tested merchandise. Porcelain and fine hardware, and other refrigerator features are important—but after all the customer is buying protection for her foodstuffs. And if you sell her cork-insulated cabinets, you give her this protection permanently.

Yes, corkboard is the one permanently dependable insulation. It is moisture-resistant, not for just a little while, but year after year. Corkboard insulation does not deteriorate. Current costs stay low.

The cold storage industry will bear witness to the faithful service of corkboard. For years they've depended on cork insulation, protected millions of dollars worth of perishable commodities with corkboard. Yes, they've tested substitutes—and continued to depend on the one dependable insulation.

These are facts, no fancies. So be sure that you can say: "Corkboard insulation!" when your customers ask the important question. It's the logical, profitable thing to do. Armstrong Cork & Insulation Company, 917 Concord Street, Lancaster, Pennsylvania.

Armstrong's Corkboard

The standard insulation for all refrigeration

Manufacturer's Reputation is Entrusted to Service Man

By George T. Sutphen
Service and Installation Manager
Detroit Kelvinator Branch

IN the organization and operation of a Distributor's service we feel that the first and foremost part of organizing is to sell the product to the Organization. We feel that everyone in the Organization should feel that the product that they are distributing or helping to distribute and place on the market is the best product available. They must be sold on the fact that their product has as many good points and less poor points than any other product. We also take particular care to sell the Organization on the factory personnel. We impress upon the personnel of our Organization that the executives at the factory are picked because of proven merit for their particular position. In doing this we achieve this good, that each person feels that in having the very best of superior executives, that these executives in turn can do him the most amount of good in helping them solve his particular problem.

Loyalty to the Organization as a whole is a very particular point. In dealing with the public and confronting the problems that daily arise, it would be disastrous for us to have any person that was not one hundred per cent loyal to the parent company, as well as the Organization that is assisting in the distribution of the product. One little word spoken in the wrong place would lead a customer to feel that all was not well as a whole and that he had purchased a machine from an Organization that was not welded into a proper functioning Organization. All individuals that do not conform to this are weeded out as rapidly as possible.

The next point is the hiring of personnel. We find on installatnon and service that men of twenty-five to thirty years of age, who up to the time of starting on electric refrigeration have accomplished some definite aim in life, prove out to be the best men.

We must be very careful in choosing help not to pick men who are rapidly transferring from place to place, and we must have a man sold on what he intends to do. We have been very successful in training electricians and machinists on electric refrigeration. We have had far better success in training such men than in trying to train plumbers and tool makers. We find that plumbers are as a whole not as well adapted to this particular type of work, due to the fact that a great many of them are more or less careless in the way they do their work. We find that tool makers are highly trained and specialized in that particular line of work, and after a short time the installation and servicing of refrigeration machines turns into rather a dull and humdrum life, and they soon become dissatisfied and drift back into their original trade. We first start the men as helpers to a well trained domestic or apartment house installation man. On an average they work from one to three months, and then they are sent to the factory for a week's training on domestic and later on commercial installation and service. We require one week of training on domestic and one week on commercial, feeling that it would be impossible to obtain the proper training in a shorter time.

In the choosing of help we select men who have courteous characteristics. They must be cleanly and neatly dressed and men of high caliber, whom we feel can safely carry out our policies to the customer. We feel that there is nothing quite as detrimental to our position in rendering service to the customer as to have anyone call us and inform us that our men are discourteous, that they are not careful in their work, and that the machine is no better than it was before they started work on it. From the day that an employee starts with us we immediately start a course of training, and daily contact with this employee to train him on the importance of carefully and correctly filling out orders, returning all parts that are not used on the job, and obtaining a receipt for them, and on all details connected with the keeping of our files and records.

Installation

In the installation department all orders are centralized and come to the installation desk from the credit department. The installation clerk receives practically all calls for installations and start-ups of installations. He in turn passes this information to the order department; the order department also receives a great number of installation calls. During the day orders for the following day are passed on to the stock room, where the material is prepared for shipment on the following morning. After the installation is made the name of the purchaser and his address is turned over to the service department for its permauent record. All our domestic and commercial trucks are equipped with a complete truck stock. This truck stock consists of all parts necessary to properly install and place in operation complete units, or enough, in fact, to complete the installation of several units. Two copies of the installation order, covering each installation, are given to the installation crew. The parts used are filled in on both copies by means of carbon paper and the original is used for our permanent records. The duplicate is turned in to the stock room and the parts used on each job are replaced in the proper truck stock. This keeps the truck stock on a balance at all times.

On apartment house installations we follow a somewhat different system. All material is requisitioned out on a material requisition, and these requisitions are passed directly to the cost department. When the building is completed a pick-up order in detail is made for material not used on the job, and this is picked up by the stock room truck and returned to stock. We require that a man work at least one year in our installation department before he is transferred to service. We find that it takes the average man that long to acquire enough mechanical knowledge and enough general training before he would be competent to work on service.

In the case of service men who come to us with training from other companies, we require them to work at least three months on installation work, so that we can obtain a better knowledge of them, their habits, conduct, personality and honesty before they are allowed to go out on service and enter the number of homes that are necessary for a service man to enter in a year's time without having complaints come to us about misconduct and so forth.

Service Department

In our service department, the service men report directly to the service dispatcher. The service dispatcher is in charge of the service desk and service men responsible directly to the service manager. On this desk we have a trunk system of six lines. In this way we enable the customer to communicate with the department promptly. The service dispatcher, with some assistance, takes down all of the service calls. We have in the city of Detroit approximately 36,000 installations, and on our busiest day last summer the highest number of service calls received was 150 in one day.

Our service men are paid on an hourly basis, plus a monthly car allowance for the use of their cars. We much prefer to handle this on an hourly basis, rather than on a monthly basis, due to the fact that in the warmest season of the year it is necessary to work longer hours than would be considered advisable in working men on a weekly basis in order to render prompt and efficient service to our customers. On this basis we pay the men actually the hours that they work, and we do not ask any man to do something for nothing. In the winter time when the working days are shorter and we receive a less number of service calls, we can lay the men off or work them shorter hours and have absolute control of our cost of service.

Our service terms are C. O. D. upon completion of our work. We strive to have our service men collect on every call, if possible. However, as with all other business, there are a great number of our customers whom we do not ask

(Concluded on Page 15, Column 1)

The **Filtrine Filter** assures **pure, clear water** from your **ELECTRIC Water Cooler**

WRITE FOR DETAILS

FILTRINE MANUFACTURING COMPANY
49 LEXINGTON AVE. *Brooklyn, N.Y.*
Manufacturers of FILTERS & COOLERS *of all sizes.*

KELVINATOR SERVICE

(Concluded from Page 14, Column 3)

to pay cash upon completion, as they have already established credit with us, but we find that if we did not make an attempt to collect our service C. O. D. on completion of work, that on the numerous service calls it would be necessary for us to increase the cost in order to take care of our collections.

To stimulate the effort on the part of our service men to collect, rather than to charge the call, we pay a 10 per cent commission on the gross C. O. D. sale. This includes labor and parts. Our collections at the present time are mostly on domestic sales. On practically all of our apartment houses we do not attempt to operate a C. O. D. service, unless our records have proven to us that the status of this building financially is such that it is impossible to render service on any basis other than C. O. D. Commercial accounts are also on a C. O. D. unless they are on established credit with us.

Each service man has allotted to him a certain quantity of service stock, for which he is held strictly accountable. The truck stocks are checked on an average of once a month, and in the event that their stock is short, the shortage is charged to their accounts. In this way we are able to maintain absolute control of our material.

We have tried many ways to take care of the night service. We have tried having night men on permanently; we have tried rotating and have men working one week nights, but last June we started a system which has overcome practically all of the objections that have arisen from time to time. We have a schedule that changes daily. Service men, one, two or three, in the amount that we find necessary to take care of the service calls, report at 8 A. M. and work through until 11 P. M. at night, and on that particular day should a gas leak come in after eleven o'clock, they would be called out to take care of this. In this way the men only have to work one long day every week. This we find the most satisfactory arrangement that we have been able to put in operation.

We require our men to call in from four to six times a day. When a service call comes in the installation date is looked up in our files and placed on the card, so that the service man to whom the call is assigned knows whether the machine is beyond the guarantee period or not. Also, in the event that the customer calling in complains of previous service calls, this is also looked up so that there is no misunderstanding at the time the service is rendered. Our man knows the exact status of the service that has been rendered and the age of the machine. We find in this way that we can satisfy our customers much better than by allowing the calls to go out without a complete checking and verification of our records. We also have a service meeting twice monthly. At this meeting service, installation and stock room departments are present. In that way we can be in close touch with all departments.

Stock Room

It is absolutely essential that the stock room work closely with the service department, and maintain the proper stock at all times, so without delay the requirements of service can be satisfied without accumulating an unreasonable surplus. Without 100 per cent co-operation in this respect it is impossible for service to function properly, rendering service at a minimum cost to satisfy all owners, however unusual the requirements may be.

MILWAUKEE BUSINESS OUTLOOK FAVORABLE

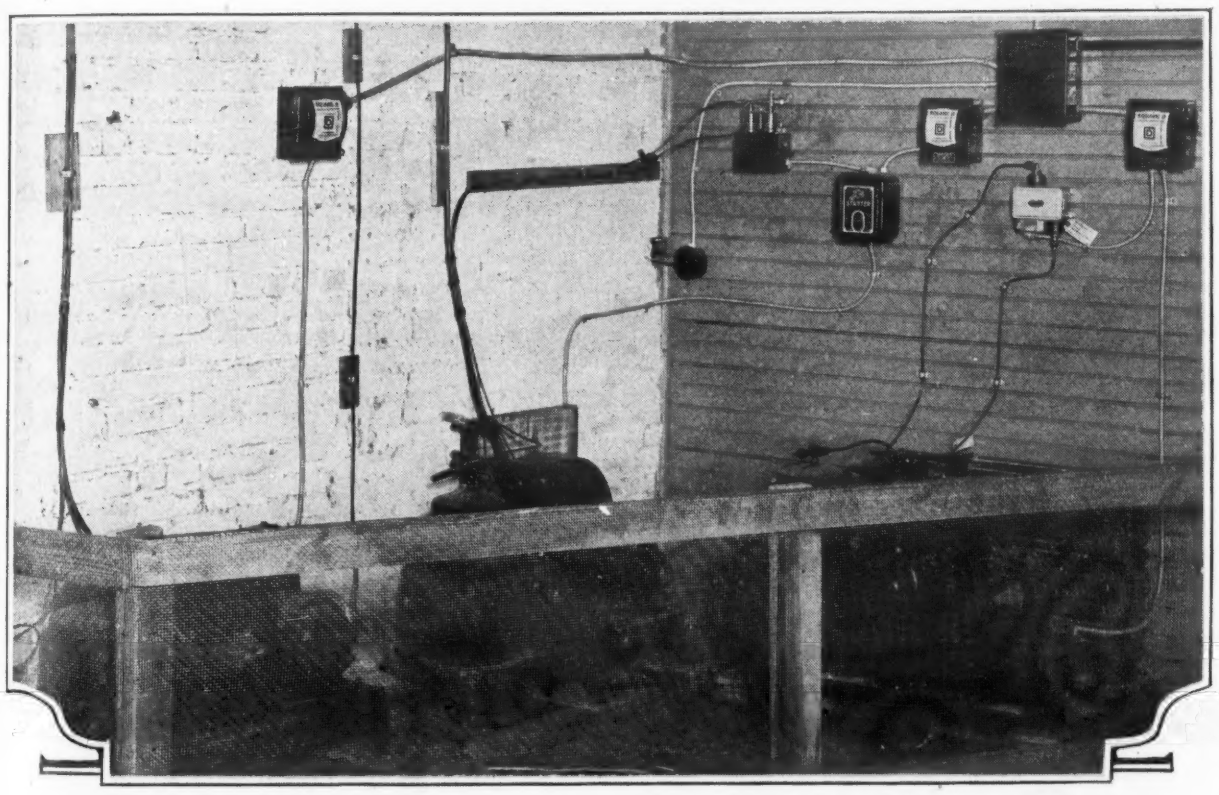
Milwaukee, Wis.—Building operations are picking up and the employment problem is rapidly being bettered here. In the electric refrigeration field orders are mounting and the distributors are hopeful of having a very fine year. Several large orders have been secured by the following companies: The E. H. Schaefer Co., the Lindsay Automatic Refrigeration Co., the Electric Co., who represents Kelvinator.

Dealers and salesmen report a more and more favorable interest on the part of the buying public. People are becoming more educated to the needs of proper refrigeration. During the week of March 15 the annual Home Show was held at the Milwaukee Auditorium, and many of the distributors had exhibits which were largely attended. Many orders were taken by distributors and in many cases prospects were secured.

ELECTRO-KOLD SEEKS HAWAIIAN MARKET

Spokane, Wash.—The Electro Kold Corp. has been going extensively into the business of keeping perishable foods cool in Honolulu. Since the Hawaiians are asking for more and more electric refrigeration in their summery clime, regular shipments are made by the company, in order to supply the demand of the metropolis of the Hawaiian Islands, where the office opened for Electro Kold has reported conditions fine, since they have "broken the ice" at that point for the more extensive usage of refrigeration units.

Kelvinator After Chain Store Business in Birmingham Territory



IN Birmingham, Kelvinator has equipped a large number of Atlantic and Pacific Tea Company stores. The installation pictured above was made in one of the stores recently opened there. Three Kelvinator units refrigerate the Warren cases and coolers used for keeping perishables.

E.T.L. Service for Domestic and Commercial Electric Refrigeration

Testing and experimental laboratory service for Manufacturer, Distributor, Central Station—Test data exclusive property of client.

ELECTRICAL TESTING LABORATORIES

80th Street and East End Avenue, NEW YORK CITY, N. Y.

ICELECT REFRIGERATION

Tried and Tested

Cylinder Evaporators

Especially built for

SODA FOUNTAINS *and* ICE CREAM CABINETS

ICE CREAM CYLINDER EVAPORATORS

Gone *are the days of* Brine

YOU KNOW THE STORY OF BRINE FREEZING—
NOW READ THE STORY OF BRINELESS FREEZING

HOW IT WORKS

The evaporators are made up of two corrugated cylinders spaced one-eighth of an inch apart and welded on the ends—"B," ice cream can; "C," space between cylinders for refrigerant; and "D," bottom. Each cylinder requires approximately one pint of refrigerant.

The refrigerant enters the first cylinder through expansion valve. When the first cylinder fills, it overflows into No. 2 cylinder, and so on. The temperature control is mounted on the last cylinder. When the refrigerant reaches the top of the last cylinder the thermostat stops the compressor. Now, while the compressor is inoperative, it will be seen that each cylinder is full of refrigerant, just the same as a flooded system. The remarkable efficiency attained is due to the fact that the refrigerant between the walls offers a 100 per cent freezing area in direct contact with the ice cream can. Further, the oiling problem is taken care of automatically, as follows: Oil enters the first cylinder which remains on top. Naturally the oil is the first to overflow into No. 2 cylinder, and so on, until it returns to the compressor.

The old salt and ice fountains can be made modern, dry and clean by the use of Icelect cylinder evaporators.

ICELECT REFRIGERATION CORPORATION

OMAHA, NEBRASKA

FLINT DEALERS ACTIVE AT PURE FOOD SHOW

Flint, Mich.—Nearly 30,000 women were given the opportunity at the Flint Pure Food and Household Appliance Exposition, March 18 to 22, to inspect three makes of electric refrigerators. The Allen Electrical Co., Frigidaire distributors; the Genesee Hardware & Appliance Co., Kelvinator agents, and the McCormick-George Co., General Electric distributors, had large exhibits at the show and gave constant demonstrations of their various models. All reported getting many excellent leads for sales.

Held in the new $1,500,000 auditorium of the Industrial Mutual Association, a workingmen's organization, the exposition drew attendance of 5,000 to 7,000 daily for five days. While the largest crowds were there at night, the afternoons offered all exhibitors excellent opportunity for educational lectures and demonstrations. The exposition was pronounced far the most successful of its kind ever held here, and will be an annual project of the I. M. A., according to D. P. Hotelling, managing director of the show.

Domestic science lectures and demonstrations before Flint church organizations and women's clubs during the last few weeks before the exposition stimulated popular interest in the show. Several civic organizations were active in supporting its promition.

The local electric refrigerator distributors not only joined in the promotion of such educational lectures, but during the show gave demonstrations of their products and distributed frozen foods prepared in the exhibition booths.

Besides the educational attractions, the giving away of food samples and of 50 baskets of groceries each night, added public interest to the exposition. Orchestra music and a few vaudeville numbers at night were introduced to stimulate attendance.

G. E. DEALERS MEET IN HARTFORD

Hartford, Conn.—More than 300 dealers and salesmen attended General Electric refrigerator sales meeting, held under the joint auspices of the Newton-Parsons Co., of Hartford, Modern Home Utilities Co. of Waterbury, and the Electric Device Co. of Springfield, Mass., in Hotel Bond. Michael Mahoney, assistant to the sales manager of the General Electric refrigerator department, came from Cleveland to give a sales talk. and P. B. Zimmerman, general sales manager, appeared in a "talking movie."

NEW COPELAND OUTLET DISPLAYS MODELS

Milwaukee, Wis.—The J. Kornelly Hardware Co., Third and North Ave., the largest hardware store on the north side, has recently put in a line of Copeland electric refrigerators. This store has been in business for many years, being one of the oldest in its line in the city.

KEROTEST

FORGED BRASS

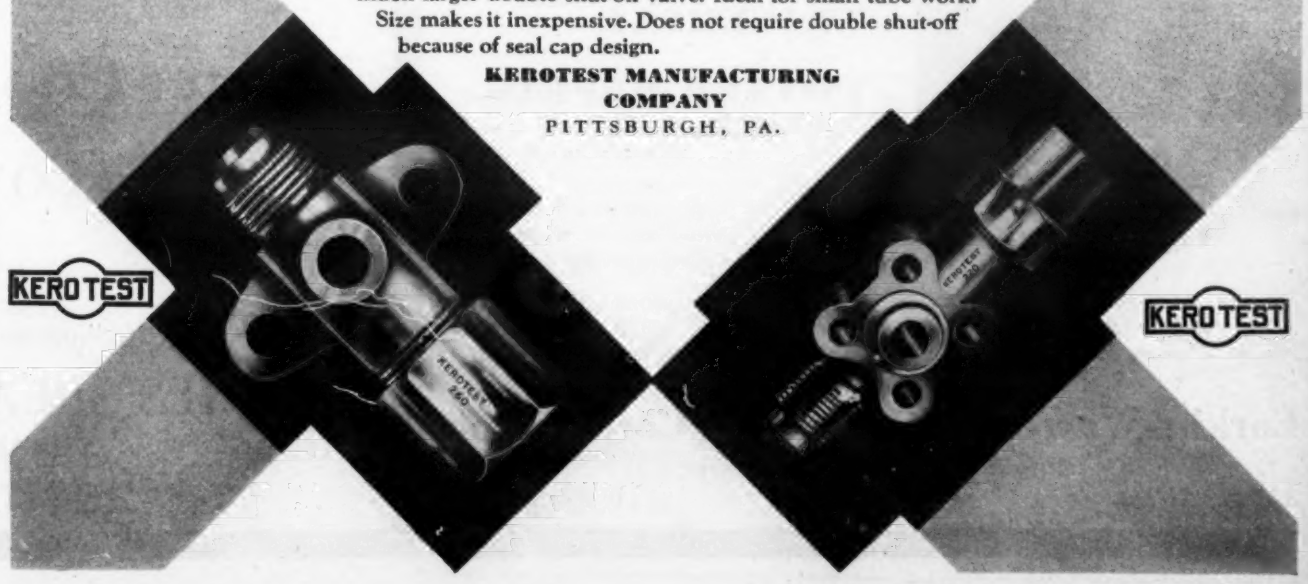
EVAPORATOR VALVES

for expansion coils, boilers and brine tanks

Illustrations show two very popular Kerotest Line and Angle Valves. The Line Valve shown is small in size but equally efficient as the much larger double shut-off valve. Ideal for small tube work. Size makes it inexpensive. Does not require double shut-off because of seal cap design.

KEROTEST MANUFACTURING COMPANY

PITTSBURGH, PA.



NEW WASHINGTON CODE

(Continued from Page 1, Column 4)

mestic models must be submitted for inspection to the inspector of plumbing, and duly approved before they can be offered for sale or installed. The code requires that a veritable model with working drawings must be submitted, a fee of $25 paid, and after approval, other refrigerators of the same model may be installed without further inspection. The holder of a permit must notify the inspector of plumbing of subsequent sales and the intended place of installation. A permit for a model includes different sizes of the same arrangement of apparatus. The Regulations and Code follow:

District of Columbia Mechanical Refrigeration Regulations

Sec. 11-b (Gas fitting regulations).

(a) No mechanical refrigerating system employing any substance other than air or water as a refrigerant shall be installed, maintained or operated in any building in the District of Columbia without a permit therefor.

(b) No system employing any substance other than air or water as a refrigerant by the direct method shall be installed or maintained in wards or private rooms of hospitals, sleeping quarters of asylums, cell blocks of institutions, or similar places where people are habitually detained, confined or helpless.

(c) No system employing more than 6 pounds of any substance other than air or water as a refrigerant by the direct method shall be installed or maintained in entrances or exits, in hallways or corridors, or under or adjacent to stairways of any building, lobbies and/or auditoriums of places of public assembly, hospital diet kitchens or similar locations.

(d) No system employing more than 12 pounds of any substance other than air or water as a refrigerant by the direct method shall be installed or maintained in buildings containing theatres, churches, assembly halls, schools, asylum dormitories, hospital wards, or similar occupancy, unless all parts containing refrigerant are in rooms having no door or opening into any part of the building so occupied but entered and ventilated from the outside.

(e) No system using the direct method of refrigeration and employing 100 pounds or more of a flammable or irritant refrigerant shall be installed or maintained, unless the premises are used exclusively for industrial or commercial purposes; or in other buildings, unless the entire refrigerating system is confined to the first floor and/or basement, or to the top floor and/or roof.

(f) No system using the direct method of refrigeration and employing 20 pounds or more of any substance other than air or water as a refrigerant shall be installed or maintained in any combination business and residence building, hotel, apartment house or multiple residence, or in retail stores in basements and/or above first floor, unless such system is protected by a secondary system constructed according to requirements of "Mechanical Refrigeration Safety Code," or unless the entire system is confined to the first floor and/or basement or the top floor and/or roof, and that portion of the building housing the system cut off from all inhabited portions of the structure and from entrances thereto and exits therefrom by unpierced fire resistive walls, through which pipes other than steam or hot water mains, may be run if properly sealed with asbestos wool.

(g) No permit shall be issued for any system employing 100 pounds or more of refrigerant until plans for installation have been filed and approved.

(h) Before any unit system employing 20 pounds or less of any substance other than air or water as a refrigerant shall be offered for sale, sold or installed in the District of Columbia, it must have received approval and a general permit for sale and installation.

A veritable model shall be submitted with application, together with factory or working drawings therefor, and it shall be examined by the Inspector of Plumbing. If it is found to be in substantial agreement with the requirements of the Mechanical Refrigeration Safety Code provided for herein, a general permit shall issue, permitting their sale and installation in the District of Columbia, and no permit shall be required for each individual sale or installation, provided: that the permittee shall notify the Inspector of Plumbing, at the time of sale, on blank forms to be furnished by him, of the place of intended installation.

A permit for a model shall be held to include and cover different sizes of the same arrangement of apparatus.

(i) Permits shall be issued by the Inspector of Buildings after approval of the application by the Inspector of Plumbing and payment of required fee to the Collector of Taxes.

(j) Remote systems with two or more evaporators, any part of which is in an inhabited portion of any building, shall be inspected and/or tested annually by the Inspector of Plumbing.

(k) The permit and inspection fees shall be in accordance with a schedule of fees adopted by the Commissioners of the District of Columbia from time to time.

(l) All refrigerating apparatus and the installation, extension or repair thereof shall be in accordance with the "Mechanical Refrigeration Safety Code" as approved by the Commissioners of the District of Columbia, and kept on file in the office of the Engineer Commissioner. Permits shall be subject to suspension or revocation by the Commissioners for cause or for failure to comply with said "Mechanical Refrigeration Safety Code."

Mechanical Refrigeration Safety Code

SECTION 100. SCOPE, PURPOSE AND APPLICATION.

101. Scope: This code is intended to apply to every installation of refrigeration apparatus and to apparatus for the storage of reserve refrigerant installed after July 1, 1930. This code shall also apply to the repair, modification or extension of existing installations when necessary for the public health or safety.

102. Purpose: The purpose of this code is to provide reasonable safety for life, health and property.

103. Application: Buildings, stairways, exits, moving machinery, transmissions, steam, plumbing and electrical installations, pressure vessels, etc., not specifically covered by this code shall conform to their respective rules and regulations.

SECTION 200. DEFINITIONS.

201. "Approval," official approval by the authority having jurisdiction.

202. "Buildings: Public, Business and Residence," are buildings as so defined by the Building Code of the District of Columbia.

203. "CONTAINER," a cylinder for the transportation of refrigerants constructed to conform to the regulations of the Interstate Commerce Commission.

204. "DIRECT METHOD OF REFRIGERATION," a system in which the evaporator is located in the material or space refrigerated, or in air circulating passages communicating with such space.

205. "EVAPORATOR," that part of the system in which a refrigerant is expanded or vaporized to produce refrigeration.

206. "FLAMMABLE REFRIGERANT," any refrigerant which will burn when mixed with air, such as ethane, propane, butane, iso-butane, ethyl chloride and methyl chloride.

207. "FUSIBLE PLUG," a device having a member fusible at a predetermined temperature, for the relief of pressure.

208. "INDIRECT METHOD OF REFRIGERATION," one in which a liquid cooled by the refrigerant is circulated to the material or space refrigerated, or is used to cool air so circulated.

209. "INHABITED," any room or rooms and/or connecting space in which a person, family or group of persons reside and/or sleep, including transient occupancy for such purposes, or any room or space used for display and/or sale of merchandise where the number of transients or customers frequently outnumber the employees.

210. "IRRITANT REFRIGERANT," any refrigerant which has a harmful or irritating effect on the eyes, nose, throat or lungs, as ammonia or sulphur dioxide.

211. "LIQUID-RECEIVER," a vessel, permanently connected to the high pressure side of the system for the storage of refrigerant.

212. "MACHINERY ROOM," a room (other than a refrigerated space) in which is located any pressure imposing element, condenser, receiver or shell-type apparatus.

213. "PRESSURE IMPOSING ELEMENT," every device or portion of the equipment used for the purpose of increasing the pressure upon the refrigerant, whether by mechanical means or through temperature or chemical change.

214. "PRESSURE-LIMITING DEVICE," a pressure- or temperature-responsive mechanism for automatically stopping the operation of the pressure-imposing element at a predetermined pressure.

215. "PRESSURE-RELIEF DEVICE," a pressure-relief valve, a rupture member, a fusible plug or other approved device for relieving the pressure.

216. "PRESSURE-RELIEF VALVE," a valve, held closed by a spring or other means, which automatically relieves pressure in excess of the setting.

217. "REFRIGERANT," the substance used to produce refrigeration.

218. "REFRIGERATING SYSTEM," a combination of parts in which a refrigerant is circulated for the purpose of extracting heat.

219. "REMOTE SYSTEM," one which uses the direct method of refrigeration and cannot be removed either with or separately from the space refrigerated without disconnecting any refrigerant containing parts.

220. "RUPTURE MEMBER," a device which will automatically rupture at a predetermined pressure.

221. "SERVICE VALVES," a key-operated shut-off valve in Class "C," "D" and "E" systems used only during shipment, installation and repairs.

222. "STOP VALVE," a shut-off valve installed in a refrigerant line for controlling the flow of refrigerant.

223. "UNIT SYSTEM," one which can be removed either with, or separately from the space refrigerated, without disconnecting any refrigerant containing parts.

SECTION 300. CLASSIFICATION

301. Refrigeration systems shall be classified according to the total weight of refrigerant, either contained therein or required for satisfactory operation.

302. A Class A System is a system containing one thousand (1,000) pounds, or more, of refrigerant.

303. A Class B System is a system containing one hundred (100) pounds, or more, of refrigerant, but less than one thousand (1,000) pounds.

304. A Class C System is a system containing twenty (20) pounds, or more, of refrigerant, but less than one hundred (100) pounds.

305. A Class D System is a system containing more than six (6) pounds of refrigerant, but less than twenty (20) pounds.

306. A Class E System is a system containing six (6) pounds, or less, of refrigerant.

SECTION 400. FEES, REINSPECTION

401. The fees for permit and inspection at time of installation shall be as follows:

Class A—$20.00 and $1.00 additional for each separated refrigerated space or connection therefor.

Class B—$10.00 and $1.00 additional for each separate refrigerated space or connection therefor.

Class C—$5.00 and $1.00 additional for each separate refrigerated space or connection therefor.

Class D or E remote systems—$2.00 and $1.00 additional for each separate refrigerated space or connection therefor.

Class D or E unit systems—$25.00 for each model submitted for approval.

Class D or E unit system of a model for which no permit has been issued—$2.00 each such unit.

402. The fee for annual reinspections of remote systems in inhabited buildings and maintenance permits shall be $3.00 for each test of each such system.

SECTION 500. DESIGN, INSTALLATION AND TESTING

501. Every part of a refrigeration system, except pressure gauges and control mechanism, shall be designed to withstand safely and without injury the following required minimum test pressures:

Refrigerant Used	High Side Part	Low Side Part
Carbon Dioxide	1,500	750
Ethane	1,100	550
Ammonia	300	150
Propane	250	150
Methyl Chloride	175	125
Sulphur Dioxide	135	100
Iso-Butane	135	100
Butane	100	50
Ethyl Chloride	100	50
Dichloromethane	15	15
Dichloroethylene	15	15
Trichloroethylene	15	15

For other refrigerants not listed herein, test pressures shall be as directed by the Inspector of Plumbing.

502. Systems containing over twelve (12) pounds of refrigerant, which are assembled and piped in place, shall be tested by the installer in the presence of the Inspector of Plumbing. A dated declaration of such test, signed by the Inspector of Plumbing shall be posted in the machinery room. Tests shall include a vacuum and a pressure test of the refrigerant containing system, preferably with the evaporators installed, but valves thereon may be closed to prevent withdrawal of the refrigerant. Under the vacuum test, a vacuum of 20 inches of mercury shall be placed upon the system and shall be held for a period of not less than 20 minutes, with no detectable drop, after the pump has been stopped. Under the pressure test every part of the system except pressure gauges and control mechanism shall withstand safely and without injury the required minimum test pressure. In the case of remote systems employing seamless metal tubing and a flammable or irritant refrigerant, notice shall be given so that refrigerant or protective lines to be concealed may be inspected and/or tested before covering in on the work.

Every secondary or protective system shall be tested on completion and annually thereafter by temporarily sealing the ventilation opening at roof, attaching gauge and determining that the contained pressure is not being augmented by leaks from the refrigerant carrying system. If no increase in pressure is noted, then a pump shall be attached and a pressure of four inches of mercury shall be applied and maintained for ten minutes without appreciable diminution. In case of leak, repairs shall be made and the test again applied, until the system is proven tight.

503. All refrigerant lines of Class "A" and "B" systems shall be of standard weight of steel, iron or brass pipe for refrigerants requiring test pressures of 150 pounds or less and of extra heavy weight steel, iron or brass pipe for refrigerants requiring test pressures of over 150 pounds.

504. All refrigerant lines of Class "C," "D" and "E" systems shall be as provided in paragraph 503 except that new seamless copper or other suitable new metal tubing of not less than 0.034 inch wall thickness for diameters not exceeding 5/8 inch, and of correspondingly greater wall thickness for larger diameters, may be used, provided all joints are either sweated, brazed or an approved union flared joint.

505. In systems for conditioning and/or cooling air, no evaporator refrigerant carrying pipes or parts shall be directly exposed in the air circulation system. Liquid cooled by an irritant or flammable refrigerant shall not be used in a spray form to cool or condition the air.

506. A remote system of Class "C," "D" or "E" employing a flammable or irritant refrigerant, any part of which system is in an inhabited portion of a building, whether constructed in accord-

(Continued on Opposite Page)

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Standard Factory Equipment!

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ESTABLISHED 1856

WASHINGTON CODE

(Continued from Opposite Page)

ance with paragraph 503 or paragraph 504, shall be installed as follows:

(a). All refrigerant lines shall be enclosed in a secondary or protective system consisting of standard weight brass, iron or steel pipe, not less than 1¼ inches in diameter, cast recessed drainage fittings and cast metal junction and valve boxes, so that the entire refrigerant carrying primary system of pipe or tubing, valves and fittings shall be fully enclosed in a gas tight casing.

(b). All changes in direction shall be made with junction boxes or long turn pattern fittings and all connections shall be by standard thread full screwed joints. The secondary system shall be continuous from a point within five feet of pressure imposing element to and including connection into each evaporator unit.

(c). Each secondary system having connections on two or more floors shall be extended above the main roof of the building and there provided with a return bend or other suitable fitting for ventilation purposes, trapped to contain a continuous seal of a suitable oil or liquid or connected into a similar ventilation pipe so extended, trapped and sealed. The end nearest the pressure imposing element shall be securely sealed and provided with an approved air pump connection, so that the entire secondary system may be tested under air pressure at any time by closing roof ventilation and attaching pump.

(d). Every evaporating unit or any part thereof in contact with refrigerant shall be constructed of metal sufficiently rugged to turn the end of an ice pick without injury to the unit, or shall be completely encased in and protected by a casing or shield so constructed.

(e). All pipes, junction or valve boxes, fittings, refrigerators or other parts of the system shall be permanently secured in place.

(f). A stop valve must be placed in each high or low pressure line and shall have attached thereto a hand wheel or other ready means of operation. Stop valves shall be located near the pressure imposing element and in each service outlet box.

(g). Not more than a single tenant shall be supplied from an outlet box, which shall be located within the premises of the tenant served, but not within the refrigerated space; and it shall be located so as to be readily accessible at all times.

(h). Refrigerant lines shall not be located in any hallway, stairway or vertical shaft not cut off at each story; or in elevator, dumb-waiter or other shafts containing moving objects.

507. A remote system in a building used exclusively for industrial or commercial purposes, or a remote system of Class "C," "D" or "E," confined to the first floor and/or basement in any combination business and residence building, hotel, apartment house or multiple dwelling, shall be constructed in accordance with paragraph 503, or may be constructed in accordance with paragraphs 504 and 506, except that roof ventilation of secondary or protective system will not be required.

508. All pipe, fittings and valves shall be those suitable for refrigeration installations for the refrigerant intended.

509. All piping, liquid receivers or vessels containing refrigerant shall be supported on or by strong and durable materials.

510. Every system which may be charged after installation shall have the charging connection located on the low pressure side.

511. Liquid level gauge glasses, except those of the bull's-eye type, shall have automatic closing shut-off valves, and such glasses shall be adequately protected against injury by slotted metal casings.

512. Except in buildings used exclusively for ice making, ice cream making, dairies, bakeries, breweries, cold storage and similar industries, the pressure imposing element, condenser, receiver, or shell type of apparatus of any system employing an irritant or flammable refrigerant shall be, together with the test terminals of all secondary protecting pipes for remote systems, located in a machinery room or rooms, used exclusively for that purpose, cut off from the rest of the building by unpierced (except as provided in Sec. 11b-f) fire resistive walls and ceilings (floors) and entered and ventilated from the outside, except that, if the amount of refrigerant required by or contained in a system is not more than twelve (12) pounds then the requirement for a separate machinery room will not apply. Every machinery room in which there is a system employing 500 pounds or more of flammable refrigerant shall be provided with at least two exits.

513. Where there are several systems each employing 12 pounds of refrigerant or less, they need not be located in a separate machinery room, but the pressure imposing elements and their connected apparatus shall in no case be placed closer to each other than fifteen feet, and they shall be adequately protected by suitable screening or guards.

514. No refrigerating machinery shall be installed in any vault or projection beyond the building line.

515. All electric wiring connections shall be made in accordance with the electric wiring regulations of the District of Columbia.

516. All drain, waste, water supply and illuminating gas connections shall be made in accordance with the plumbing and gas-fitting regulations of the District of Columbia.

SECTION 600. SAFETY DEVICES

601. Pressure-relief valves, pressure-limiting devices and rupture members, shall be made of suitable material for the refrigerant employed, and shall be constructed and set to prevent the pressure exceeding the test pressure.

602. The size of relief valves shall be as follows:

Capacity of System	CO_2 and Ethane No. Req. Size	Other Refrigerants No. Req. Size
Up to 1,000 lbs.	one ½"	one ½"
1,000 to 1,800 lbs.	one ½"	one ¾"
1,800 to 3,000 lbs.	one ½"	one 1"
3,000 to 5,250 lbs.	one ½"	one 1¼"
5,250 to 7,500 lbs.	one ¾"	one 1½"
7,500 to 13,500 lbs.	one 1"	one 2"
13,500 to 27,000 lbs.		two 2"

603. Where rupture members are permitted and used, the equivalent area of the relief valve specified must be provided.

604. Fusible plugs shall have a maximum fusing point of 280° F. The free opening shall be one-sixteenth inch (1/16") in diameter for one hundred pounds (100 lbs.) or less of refrigerant.

605. All Class "A," "B" and "C" systems operating above atmospheric pressure shall be provided with a pressure-limiting device to stop the action of the pressure-imposing element at a pressure less than 90% of the setting of the pressure relief device on the high pressure side.

606. Each pressure-imposing element of a Class "A" or "B" system shall be protected by a pressure-relief valve connected into the high pressure side between the main stop valve and the pressure-imposing element to relieve excessive pressure into the low pressure side of the system or to the atmosphere.

607. The low pressure side of every Class "A" or "B" system shall be provided with a hand-operated relief valve for discharging the refrigerant in case of fire, either to the atmosphere, to a suitable body of water, or through an approved deluge or mixer.

608. The hand-operated relief valve shall be located outside of the machinery room, or shall be capable of operation from the outside.

609. Shell type apparatus, such as liquid receivers, condensers, evaporators, liquid separators and absorbers of Class "A," "B" and "C" systems which can be shut off by stop valves shall each be equipped with a pressure-relief valve, discharging as hereinafter provided.

610. No stop valve shall be located between a pressure-relief device or pressure-limiting device and the part of the system protected thereby, unless two devices of required size are used and so arranged that only one can be cut off for repair purposes at any one time.

611. Class "C," "D," and "E" systems, unless so constructed that they will not burst, due to the expansion of the refrigerant when subjected to abnormal outside temperature such as that generated in a fire, shall be protected by a pressure-relief device.

612. All water cooled Class "C" and "D" systems so constructed that the pressure-imposing element is capable of producing a pressure in excess of the test pressure and containing more than twelve pounds (12 lbs.) of refrigerant, shall be provided with a pressure-limiting device to stop the action of the pressure-imposing element if the water supply fails.

613. Where an irritant or flammable refrigerant is used, the discharge from the pressure-relief valve on the high pressure side must be conducted to the outside atmosphere or into that part of the low-pressure side protected by the low-pressure relief valve. The discharge to the outside atmosphere from either the high or low pressure side, must be not less than 12 feet above the grade, and in no case less than 12 feet above any stairway, fire escape opening, or window within a radius of 40 feet therefrom. The discharge pipe shall be not less than the size of the relief valve outlet. The discharge from more than one relief valve may be run into a common header, the area of which shall be equal to the areas of the pipes connected thereto. The outlet shall be turned downward.

614. Where ammonia is used in a Class "A" system, the discharge shall be through an approved Fire Department

(Concluded on Page 20, Column 1)

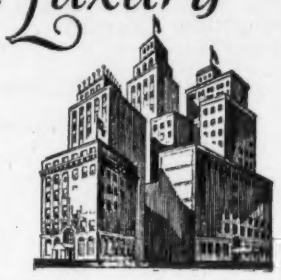
Sells As He Rides

WHILE on his way to Mississippi for a visit, S. F. Osteen, manager of the Electric Refrigeration Co. of Tampa, had little difficulty in spending the weary hours aboard the train. He talked to the train crew and found that all members of it, except S. H. Tidwell, baggage master, were owners of General Electric refrigerators.

Wishing to make the crew 100 per cent G. E., he proceeded to sell the baggage master on the idea of proper refrigeration. After an hour's sales talk, an order for a P-52 was wired to Tampa from Macon, and the refrigerator was immediately placed in the trainman's abode.

RECO ELECTRIC MILK COOLING
"The Boiler Plate Cabinet"
DOMESTIC UTILITIES
Division of the Refrigeration Corp. of Maryland
ARLINGTON, BALTIMORE, MD.

Enjoy the Luxury of a
PARLOR BEDROOM & BATH
at about the cost of an ordinary Hotel Room



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For Automatic Refrigeration
"Built Right - - to Stay Tight"

In addition to a complete line of standard fittings, as described and illustrated in our catalogue No. 36, we specialize on the production of seepage-proof fittings of individual design. Any combination of pipe and tube ends or special fittings made to customer specifications.

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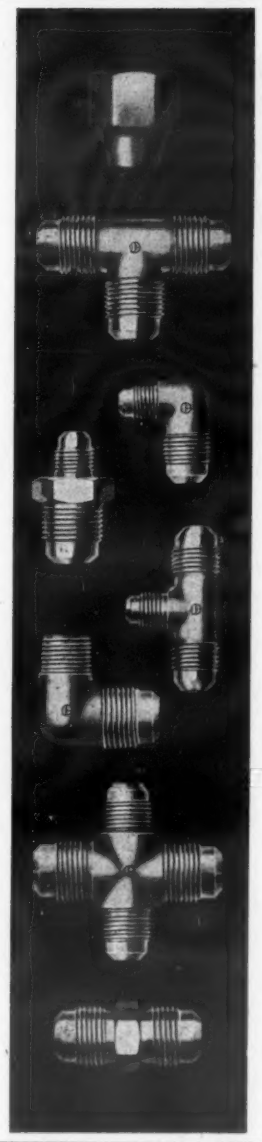

McCray Now Shipping New Top Counter Refrigerator Display Case

McCRAY is now shipping a new top counter refrigerator display case, which was recently announced by H. M. Stewart, general manager of the McCray Refrigerator Sales Corp., Kendallville, Ind. This model, known as No. 210, has a full vision front of plate glass. Wood parts in the front are of quarter-sawed oak, finished in light oak. Front panels are of white porcelain, while the base is finished in green porcelain.

The interior is of rust-resisting, heavy galvanized iron, covered with special white refrigerator enamel. There are mirrors in each end, on the inside of these models.

The two courses of heavy plate glass in the front have dead air space between. The walls are approximately 4 inches thick, insulated with 2 inches of corkboard sealed with hydrolene.

This new model is illuminated by the concealed exterior lighting system, recently developed by McCray engineers. This lighting arrangement improves the illumination of the inside of the case and eliminates all shadows. Silver glass reflecting mirrors, especially designed for intensity above the lamps, deliver all the illumination into the display compartment. One of the two plates of glass has been frosted so as to provide a uniform distribution of this intensified illumination. This is an improvement which eliminates all shadows from the interior of the case.

This new model is illuminated with three lights. These are equipped with 25-watt 115 voltage tubular lamps. The opening to the lamp compartment is covered with a fine mesh copper screen preventing insects or dirt from penetrating the lamp compartment. It is easy to replace bulbs, all that is necessary to do is to loosen two thumb nuts, permitting the lamp cover to be removed.

All wiring is readily accessible in this case by removing the porcelain jacket from the top of the case, which is fastened with six screws. The wiring is installed in conduits approved by the underwriters. There is a flush switch on the back of the case. This is not only convenient for the operator, but it avoids the possibility of damage through accident.

The wrapping counter extends across the entire back of the case, with a scale stand and paper receptacle in the center. This model is 3 feet 4 inches deep, 4 feet 2 inches high, including the base. It has 30.62 cubic feet of storage capacity.

Have You a Binder for Keeping Your Copies of Electric Refrigeration News?

How often you want to refer to a "back issue" for a certain article—an illustration—some information! Make it easy to keep every issue of Electric Refrigeration News. Buy a binder!

We can furnish an attractive "multiple binder" exactly suited to preserve copies of the paper in compact yet accessible form. The "multiple binder" contains 26 metal retaining strips which are inserted at the middle of each issue, holding the copy securely and giving complete visibility of all type matter.

The binder has stiff covers bound in good quality black imitation leather, with the name "Electric Refrigeration News" stamped in gold on the cover. **Shipped postpaid upon receipt of $3.75.**

ELECTRIC REFRIGERATION NEWS
550 Maccabees Bldg. **Detroit, Mich.**

COOKING SCHOOL GETS 400 GOOD PROSPECTS

Shreveport, La.—The A. G. Riddick Company, Inc., of Shreveport, distributors of General Electric refrigeration, has built up a live list of more than 400 prospects through participation in a cooking school staged the last week of February under the auspices of a local daily newspaper.

Besides obtaining these prospects the company also obtained a large amount of publicity through taking part in the school, and the cost was held to a minimum, according to J. C. Griffith, manager. The only outlay, with the exception of the time and effort put into the work, was a series of advertisements in the newspaper. The actual sales closed during the progress of the school more than offset the expense.

Personal and direct mail solicitation of the prospects will be used to carry on the work launched through the school.

ANSONIA, CONN. CO. NAMED DEALER FOR KELVINATOR

Ansonia, Conn.—The Gafit Electrical Co. has opened a new store at 374 Main street and has taken the local agency for Kelvinator.

This is a National Message to the American Housewife

Get the most out of your ELECTRIC, GAS *or* ICE *Refrigerator*

Send $1.00 for the two big 50c rolls (West of Missouri and South Coast States 60c per roll, both for $1.20 postpaid).
FREE: When ordering mention this ad for a Miracle Paper Dish Rag and interesting samples for You and Your Friends.

Your refrigerator will serve exactly and according to intelligent use and operation, and your palatable, health building foods will speak for themselves when served.

Are you using both KVP Refrigerator Papers? Try the famous pair—Heavy Waxed Paper in "Cutter Box"—it seals tight (one sheet will do) keeps the moisture in or keeps the moisture out as desired. However, remember all foods should not be wrapped in Waxed Paper—for 100% results you also need KVP Household Parchment, the waterproof paper for cooking and for wrapping all moist, greasy and wet foods—a cheesecloth substitute (you can boil it) like a rag when wet—use it again and again—it wears.

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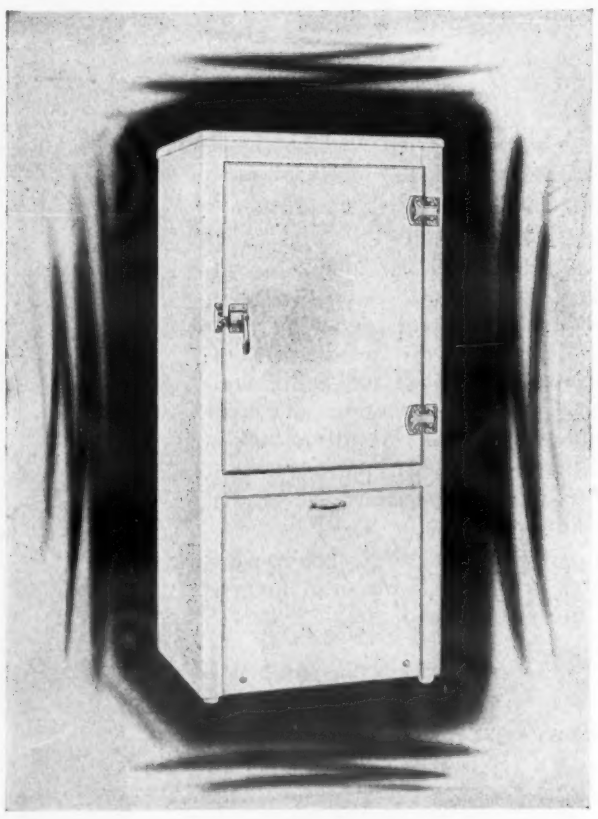
IF you are in any way interested in Electric or Gas Refrigeration ... read the above over twice because it will mean much to you. . . this is our National message to the American Housewife in cooperation with your refrigerator sales campaigns. Write for samples and advertising ideas that sell your refrigerators to new customers and keep old customers interested

This new

Universal Cooler



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~in every sense of the word

THIS new LP-H 40 model Universal Cooler, which is being offered as a leader to our regular line, upholds the Universal high standards for quietness, economy and durability. It is just the right size for the majority of apartments and homes, is strictly self-contained and is shipped completely assembled ready to be plugged into any light socket. It has pleasing lines, porcelain interior with well rounded corners, satin finish hardware and a well planned shelf area. In short it has everything that a leader should have including a most attractive price.

Complete information on request.

Universal Cooler Corporation

Detroit, Mich. - - - Windsor, Ontario, Canada

Uniform Test Code Proposed for Refrigeration Industry

By C. F. Belshaw

ANY suggestion concerning the adoption of a uniform test procedure for checking up on the performance characteristics of mechanically-operated refrigerators is bound to raise a gesture of approval on one hand, and possibly a storm of protest on the other. For years most of the older, well established concerns manufacturing this equipment have striven for a type of test which would accurately give them a true measure of refrigerator ratings in order that they might relieve themselves of worry over possible return of equipment through failure to function satisfactorily under the conditions contemplated when sold.

On the other hand, some little attempt has been made to test equipment by promotional groups in such a way as to exemplify the merits of this or that device in order to show the rosiest possible picture to the prospective buyer, be he manufacturer, investment banker, or actual user. On one hand we have had groups striving for an accurate measure of performance, and on the other, groups interested primarily in finding a way of presenting the most optimistic story possible.

Some four or five years ago an effort was made to establish some sort of uniform test procedure for showing the relative merits of mechanically-operated refrigerators, which raised all manner of protest from both well established and promotional groups. A great deal of merit was evident in the procedure followed, though inevitably, like all pioneer attempts, it disclosed some faults which might have readily been corrected had the activities been allowed to continue and develop. This early effort was largely in the line of showing the "over all" performance of the refrigerator, with its cooling mechanism, largely from the standpoint of, and for the protection of the ultimate user, though designed to show up additional features of operation of interest to the electric utility groups. About the same time, or a trifle later, a similar effort was sponsored by George B. Bright, as reported by him before the American Society of Refrigerating Engineers, at the December, 1926, meeting. These tests were likewise devoted primarily toward showing the "over all" performance of refrigerator cabinet and cooling mechanism, though with some attempt to show detailed operating characteristics of more or less rudimentary research nature.

For some little time it has been evident that it might be desirable to bring about certain stabilizing influences upon the industry which could result from an honest facing of the facts of refrigerator performance, and which could be secured from adoption of a uniform testing and rating procedure, based upon an acceptable sound engineering basis.

Industry Now on Its Feet

It is more or less generally felt that the industry has had ample time to get on its feet in the matter of perfection of design, to a point where it will stand the close scrutiny of test without at the same time unreasonably hindering new development.

In any consideration of testing or rating procedure for any "functioning equipment," the question inevitably arises as to whether it is most desirable to test and rate the component parts separately, or as a whole, as a measure of the "over all" performance of the apparatus. In large commercial refrigeration applications, various pieces of equipment, each having separate sizes or capacity ratings, may now be assembled into a single operative device in which the "over all" performance of the combined apparatus may be quite accurately predetermined. For example, the equipment for installation in an ice plant to have 100 tons daily manufacturing capacity, may be accurately assembled, and when completed, the total capacity output will check within a small fraction of the predetermined size. Not only the capacity, but the economy of performance as expressed in kwh. per ton of ice may be quite accurately predetermined. Similarly, even smaller commercial type apparatus for installations of a ton or less of total refrigerating capacity may be accurately assembled, using pieces of equipment which have been separately tested and calibrated as to their capacity performance. Evaporators and compressors having a known B. t. u. or "pounds of ice melting effect" rating, may be assembled with reasonable assurance of performing according to prediction.

As refrigerating apparatus is reduced in size or capacity, it becomes more and more difficult to predetermine accurately performance of the combined refrigerating device. In the domestic size, it has in the past been almost impossible to predetermine accurately "over all" performance, and even today the majority of apparatus which might be submitted for test would vary from 200 to 300 per cent in "over all" performance economy as expressed by electric power requirements. Presumably, all "electric" refrigerators being marketed today are capable of thermostatic regulation so as to produce any desirable range of food compartment temperature under any ordinary room temperature conditions. In this feature, all refrigerators are closely alike, even though differing in the type of control used for handling either the refrigerant or the supply of electric current.

A great improvement has been made in motor efficiency and power drives generally in the last several years, and certain desirable characteristics of small motors for such services as refrigeration duty have been perfected and are available to the industry. This has represented a definite contribution of the electric industry to the refrigeration field, and such equipment has been perfected with the idea in mind of meeting certain desirable conditions for the benefit of the electric utility industry. In spite of this development, however, there is still a wide range of "over all" drive efficiency, which, together with an almost equally wide variation in compressor unit equipment being offered in combination with refrigerator cabinets of similar type and size, results in a rather wide variation of net results, as expressed in power demand and consumption. These considerations lead us to the belief that any type of test which is ultimately to reach the potential user in any form should be representative of the "over all" performance of the combined refrigerator cabinet and cooling mechanism, rather than an expression of refrigerating capacity of its component parts.

In any consideration of the important factors of performance of a refrigerator from the potential user's standpoint, several cardinal points should not be overlooked. The ultimate buyer and user certainly is interested in the possibility of continuity of good service over the range of temperatures and operating conditions in the user's particular locality. He or she is entirely unconcerned as to the operating characteristics at some room temperature or other operating condition not closely allied to his or her own. This user is interested not only in satisfactory operation under local conditions, but also in a reasonable "reserve capacity" to take care of unexpected peak load conditions, or hot spells, which have in the past sometimes resulted in continuous operation of the refrigerating device and none too satisfactory refrigeration. The user is quite naturally interested in certain of the characteristics of operation, such as the frequency of cutting-in of the motor and its effect of power demand upon radio, flickering of lights, and other power uses in the home. The user is legitimately interested in the length of cycle of operation, or its frequency, with the possibility of disturbance from control or motor noises.

As a general rule, there has been argued with considerable merit, that the user is not primarily interested in the "over all" economy of operation of his or her refrigerator, having bought it primarily for its convenience factors and up-to-dateness. In many cases, however, ultimate users are distinctly concerned with probable cost of operation, which can be expressed accurately only as a function of power consumption in kwh., rather than "dollars and cents," due to the wide variation in cost of power over the country at large. Rates to the domestic power user still vary all the way from 2 cents to 13 cents or more per kwh. at various points in the United States, and it is obvious that any generalities as to power consumption on a "dollars and cents" basis would lead to confusion and dissension in a great many cases. Some attempts have been made in conservative types of advertising to state that certain models use from 40 to 60 kwh. per month, depending upon local conditions of operation. Such efforts have met with commendable recognition as a step toward taking the public into the manufacturer's confidence, in that potential users could calculate with a reasonable degree of accuracy the probable cost for power in their particular case.

The Dealer's Standpoint

The utility of certain performance data from the distributor or dealer's standpoint should be considered. Many manufacturers have already prepared concise and complete performance data for the use of their distributors, set up, however, upon their own particular method of test procedure and rating, with little uniformity, especially as regards the smaller size of apparatus. Certain of the performance characteristics are of special interest to the distributor and his service department, such as the frequency of operation and its potential effect upon the servicing of controls, etc., the portion of time during which the machine operates under local conditions, showing the reserve capacity of the equipment, and the conservative possibility of freedom from service re-

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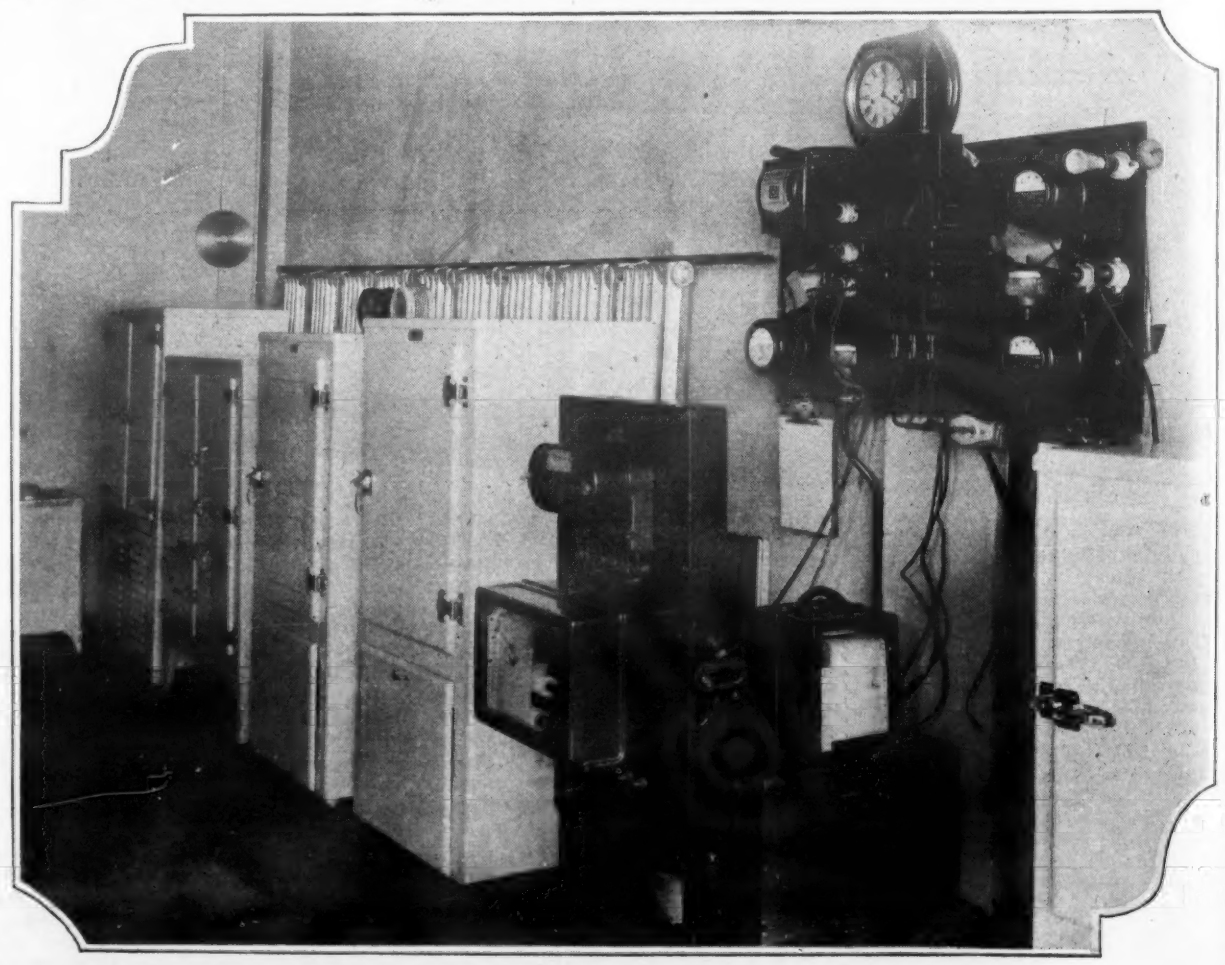


View of Bright Laboratory Showing Electric Switchboard and Meters at the right

PROPOSES UNIFORM TESTS FOR ALL REFRIGERATORS

(*Concluded from Opposite Page*)

quirements under the maximum range of temperature conditions current in his locality.

Of primary importance among the characteristics of "over all" refrigerator performance are those factors which might be used for the building up of active, sound sales data, both for wholesale and ultimate user sales. Sales information should be placed upon a sound engineering basis, with a reduction in the looseness of talk which has been so prevalent, though presumably unavoidable in the development of any new industry.

A sound, uniform basis of test and performance rating would also result in untold benefit to the public and manufacturer through the prevention of premature exploitation of new machines not yet satisfactorily or sufficiently well developed as to balance of design, as to produce reasonable "over all" economy. Such tests should safeguard the industry from excessive promotional exploitation, together with its resultant harm from having "lame duck" refrigeration of defunct manufacturers out among the public. These "orphan" refrigerators have in the past required servicing by someone, the burden in many cases falling finally upon the electric distribution companies.

In the setting up of uniform conditions of test and capacity rating of refrigerating apparatus of the domestic type, if a single basis of control setting is to be chosen, this must be sufficiently high as to represent about average summer conditions, or average winter kitchen conditions in the "over-heated" home of today. Eighty degrees is probably as near a single temperature as will ever be agreed upon to represent this condition. Under this or other assumed average condition, what are the desirable interior food compartment temperature characteristics? Top-shelf temperatures below 50 deg. seem desirable even in room temperatures up to 100 deg., yet such thermostat settings in some cases may result in excessively low food temperature at the lower range of room temperatures of 70 or 75 deg. These excessively low food temperatures under normal room temperature conditions, inevitably result in unfavorable power economy and undesirable dehydration of foods. Possibly a mean food-compartment temperature of 45 deg. F. when the refrigerator is subjected to a room temperature of 80 deg. F. represents about as good a compromise of all these factors as can be agreed upon. Normally, such a setting will result in top-shelf temperatures little, if any, above 50 deg. F. at the higher room temperatures, and minimum temperatures, little, if any, below 40 deg. at the normal room temperatures of 70 to 80 deg.

Assuming such a common setting of thermostatic regulation or control, it would then be a simple matter to determine comparative operation or performance characteristics under such a range of room temperatures as might be desirable. Peculiarly, a mean food-compartment temperature of 45 deg. under 80 deg. room temperature conditions comes close to being an average of factory thermostatic settings, and should meet comparatively little opposition from this standpoint. Minor adjustments necessary to bring about these operating conditions are usually within the normal exterior adjustment range of simple control devices without necessitating any change in the more vital functioning apparatus or equipment, such as settings of expansion valves or adjustments of refrigerant controls. Assuming that the above conditions do represent fairly accurately the average of factory settings, it then becomes desirable to ascertain just what result the variation in exterior room temperature conditions have upon food compartment temperatures within the refrigerator. Some refrigerators have been known to function almost on straight line conditions even with widely varying room temperatures, while others show perceptible increase or decrease in average food temperature under wide range of exterior conditions. These features are, if excessive, of direct importance to the user, indicating whether any additional regulation of temperature controls are desirable to meet his local condition. Generally, in the past, such regulations as have been made have been downward, in order to speed up freezing time of ice cubes. The fairness of the 45 deg. mean, as representing a compromise between economical operation from a power standpoint, and a reasonable freezing time for ice, has met with little opposition when discussed.

Load Test Presents Problem

The question of load test of refrigerators under laboratory conditions has been a subject of much debate, resulting largely in a negative reaction in the whole matter of attempts at duplicating load conditions to be met in the home. However, it has been demonstrated that the so-called "no load" test of refrigerators, i. e., 24 hours heat leakage through the walls of the cabinet, represents some 80 per cent of the total load upon the refrigerator in actual use in the home. The seriousness of losses from the opening and closing of doors, which in the past has been held as a bugaboo in the use of ice refrigerators, and as the excuse for bringing out refrigerators with from three to a half dozen doors, has largely been exploded by tests, showing that the opening and closing of doors accounts at the most for only some 3 to 5 per cent of the total power requirements. Due to the rapidity of correction by the operating mechanism of the refrigerator, little or no effect of door openings is registered upon the interior temperatures of the refrigerator, and little if any increase is detectable in power requirements.

Such arbitrary load conditions as have been frequently used consist mainly in a continuous electric heater load arbitrarily placed in some one location in the refrigerator, and due to the uniformity of distribution of load application throughout the 24 hours, result only in a slight increase in power consumption and some localized heating effect of the interior air of the food compartment. In actual use, the heat load is usually dumped into a refrigerator in three large quantities, morning, noon and night—in many cases resulting in considerable upheavel to the regularity of operation of the cooling unit, and in considerable elevation of food compartment temperatures for a matter of two or three hours at a time, immediately prior to and following meal time. An attempt to duplicate this actual usage condition has been variously made by some test groups by the insertion of a load of warm water at room temperature approximating the effect which might occur by the housewife placing in the refrigerator at one time several dishes of warm food having a large water content. The total assumed load per 24 hours was divided into three groups calculated to produce the equivalent load previously used by those groups who early advocated the continuous type heating load. Neither of these ideas seem to be sufficiently free from perfectly arbitrary conditions as to allow any possibility of immediate agreement for inclusion in any method of test procedure which might merit universal adoption. It seems likely that any immediate effort must be strictly limited to a consideration of the so-called "no load" type of test.

A Test Procedure

As with most laboratory groups, early testing as conducted by the George B. Bright Co. laboratory was more or less haphazard in procedure and crude in the development of test technique; such tests as were run a half-dozen years or more ago were largely conducted in an open room without adequate heat control devices, and largely with a miscellaneous assortment of metering and temperature recording apparatus. Various types of recording volt meters, watt meters and thermometers were used, which were more or less questionable in merit and accuracy. Realizing the shortcomings of this method of procedure, an attempt was made some four years ago to install complete equipment of the most desirable types for conducting this work.

Consideration was given to various types of high-grade indicating temperature measurement equipment. Continuous recording apparatus of the electric resistance thermometer type was chosen because of its permissibility of freedom from technical supervision during the night and over holiday periods. Equipment of this type has been in constant use since early in 1926, giving uniformly satisfactory service. For use in connection with the testing of mechanical refrigerators, recording volt meters and electric clocks for the purpose of observing operating cycle characteristics of the apparatus, were discarded in favor of graphic wattmeters showing both operating cycles and power demand characteristics. Early efforts at learning something of the temperature of the refrigerant at the discharge and suction to the compressor unit and the temperature of liquid going to the evaporator, have been largely done away with under the assumption that such details are of concern only to the manufacturer as a part of his research test procedure. The value of obtaining the ice tray sleeve temperature is of questionable merit, although the practice of obtaining this measurement has been continued in a number of cases of recent date. This temperature has some bearing upon ice freezing time for cube ice, although, unless taken in all compartments, has comparatively little value. The present procedure disregards entirely the question of detail temperature at these points, and is centered solely upon the question of accurate observation over sufficient intervals of time of the following points:

(a) Test room temperature.

(b) Temperature at top of food compartment.

(c) Temperature of bottom of food compartment.

(d) Temperature of ice tray sleeve in the fastest freezing location.

(e) Power demand as registered by graphic watthour meters.

(f) Power consumption in KWH as registered by integrating watthour meter.

Upon receipt of a refrigerator for test and analysis of its performance, complete tabulation is made of its physical dimensions, volumes, areas, etc., as illustrated by the accompanying record sheet. The data enumerated, (a) to (f) inclusive, is tabulated on various worksheet forms which are in addition to the graphic record of temperatures and power demand.

After the analysis of the physical condition and dimensions of the refrigerator, it is placed in the constant-temperature room for preliminary run and determination of its control setting under 80 degrees room temperature conditions.

After a reasonable period of time, usually from 10 to 24 hours, such slight changes in control settings as may be necessary are made to bring about as closely as possible a mean food-compartment temperature of 45 deg. F. under the 80 deg. test room conditions. After such final adjustments are made in control settings, a further preliminary test run is made to assure stable operating characteristics of the refrigerator. As be only manual records to be kept under this method of test procedure are in the reading and recording of the integrating watthour meter, a series of readings are normally taken at 8 A. M., 12 noon, and 4 P. M. throughout the entire period of preliminary and final test. Consideration of any pair of these readings 24 hours apart always serves as cross checks upon the reading accuracy of the KWH meter. This procedure also allows some latitude in choice of the 24-hour record period actually set up for consideration as the test period. Normally, all test data presented for each test temperature covers a 48-hour period, 24 hours being normally the preliminary run and 24 hours the actual test period for securing of performance rating data.

After completion of the 80 deg. test run under these conditions, tests are continued at such a variety of room temperatures as may be desired. Normally, the room temperature may be dropped to 70 deg. and a similar set of data secured under these test conditions after a reasonable length of time has elapsed for the bringing about of stable operating conditions. Subsequently, tests may be run at 90 deg., 100 deg., and higher, depending upon the desire of the client in each case.

The constant-temperature room control and metering equipment have, so far as possible, been located exterior to the actual test room. Recording thermometers and electrical measuring instruments are all located outside the test room for greater accessibility and removal from dampness when testing refrigerators under high-humidity conditions. The entire temperature control equipment is located in ducts and baffled to avoid any radiation effects upon the refrigerators under test. Direct expansion ammonia piping is operated in conjunction with an automatically controlled refrigerating machine for producing the lower room temperatures under summer conditions. The higher room temperatures are obtained by thermostatically controlled electric heaters which are located in the heat control shaft at one end of the test room. Humidity apparatus is provided with variable capacity for conducting a wide variety of humidity tests to determine the effect of humidity upon cabinet construction and insulation.

Ice Freezing Tests

One of the moot questions in connection with mechanical refrigerator tests is the matter of a satisfactory rating of the freezing time for ice cubes. Prior to the advent of various types of cold controls, the speeding up process of ice freezing time consisted largely in lowering settings of thermostats, etc., resulting in continued high power cost and excessive dehydration of foods. With the use of various types of exterior temperature adjustments, or cold controls, the normal or warm setting is considered the most satisfactory for running of food compartment temperature tests, while preserving the extra cold feature as a means of speeding up the freezing of ice or desserts in emergencies, or where extra rapidity is desired.

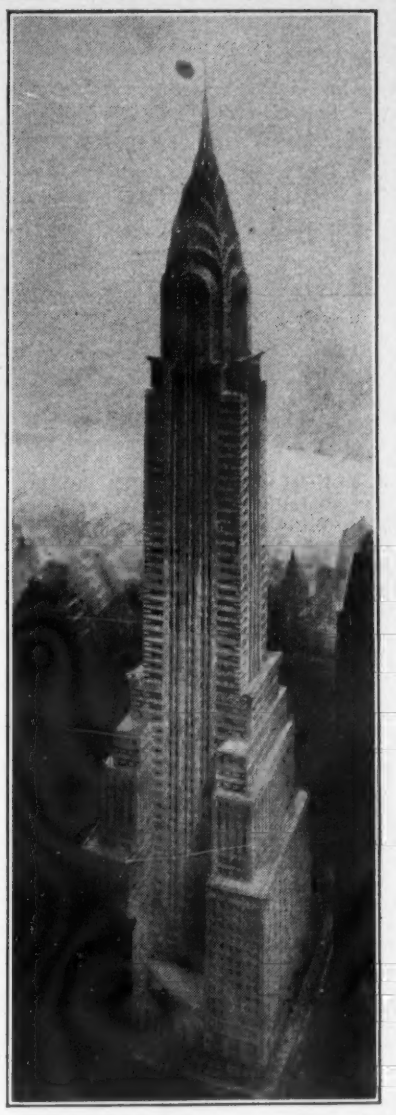
One of the most serious conditions standing in the way of any agreement upon procedure for comparative rating of freezing time lies in the fact that a wide variety of ice tray capacity is offered by the various manufacturers and styles of equipment. Some manufacturers recognize the desirability of a very large amount of ice freezing capacity and provide liberal ice tray equipment. Others, apparently, economize in this respect. It would scarcely seem fair under such conditions to load up all trays with warm water and rate performance and freezing time under such conditions. Some merit accrues to the idea of determining in a general way the freezing time of the various trays under the normal setting arrangement of cold control. With this data as a basis, it seems desirable to ascertain the best freezing time to be secured in the lower, or fastest freezing ice tray location, to demonstrate the possibility of fast-freezing requirements to fit the emergency needs of the user. This whole question of freezing time rating seems still a rather touchy one, and, although there should be some reasonable meeting ground on the subject, it promises to be one of long debate, along with that on similar technique to be developed to demonstrate the actual humidity conditions within the refrigerator as promoting or retarding food dehydration.

A Flock of G. E. Water Coolers for World's Highest Building

New York, N. Y.—A record-breaking order for bottle water coolers was scored by the Commercial Department of Rex Cole, Inc., General Electric refrigerator distributors in New York, when a contract calling for exclusive General Electric Bottle Water Cooler equipment in the seventy-five story Chrysler Building was closed by S. Arne Larsson, Commercial Specialist. It is expected that at least 450 coolers will be installed before the end of the year. This modern structure undoubtedly has won for itself the title of the most discussed building among the many proposed or completed skyscrapers in New York.

According to Mr. Larsson, the contract was signed after nearly a year of persistent competition from other manufacturers of water coolers. The choice of make, though theoretically made by the operators of this structure, actually rested with the tenant occupying the most space. The Texas Company, whose offices fill twelve floors at present, with a later increase in space probable, encountered the problem of endorsing a cooler that would be practical and in keeping with the intention of the operators of placing similar water coolers throughout the entire building.

The water coolers, although the property of the Chrysler Building, will be rented to the tenants on a monthly basis. This new arrangement opens a line of commercial selling which should progress successfully after the trail-blazing done in the Chrysler Building.

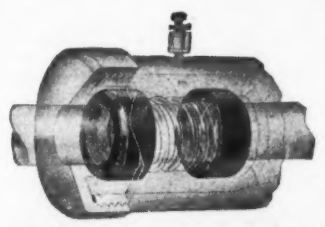


The new Chrysler Tower in New York

SHREVEPORT DISTRIBUTOR HOLDS SERVICE SESSION

Shreveport, La.—The annual service school of the Southwestern Gas & Electric Company, Kelvinator distributors, was held during the first week in March, with twenty service men attending. The school was directed by H. P. McKean, manager of the merchandising department.

One man was selected from each of the "key" towns in the territory of north Louisiana, east Texas and south Arkansas, to attend the school.



Style No. 2 Cooke Seal Ring

Small—But Oh! So Mighty!

Probably the smallest—and most important part of more and more good electric refrigerators today is its Cooke Seal Ring.

Makers and dealers alike have discovered that its use eliminates the biggest source of trouble—leaking refrigerant.

A simple mechanical device, the Cooke Seal Ring replaces inefficient seals and packing with an absolutely leak-proof seal. This seal revolves *with* the shaft and forms a ground joint against the gland face. Thus it cuts motor load as well. If you are not yet acquainted with its many money-saving qualities, write us today.

COOKE Seal Ring

20 N. Green Street Chicago, Illinois Dept. Y

Cooke Seal Ring,
20 N. Green Street, Chicago, Dept. Y.
Please send me your FREE booklet without obligation.

Name .....
Address .....
City ..... State .....

Merchant & Evans Dealers and Distributors Gather at Lancaster, Pa., to Inspect

MERCHANT & EVANS dealers and distributors from the Atlantic seaboard cities, gathered at Lancaster, Pa., recently for their annual convention. New features, which are included in the 1930 M. & E. line, were warmly received by the Easterners.

Officials of the company were present, and they outlined the plans and policies for the year. They stated that the company entered this year with an assured increased production of more than 300 per cent over 1929. The dealers inspected the M. & E. plant and viewed the processes for manufacturing a number of parts in the unit.

WASHINGTON CODE

(Concluded from Page 17, Column 4)

deluge or mixer. Where ammonia is used in a Class "B" or "C" system, the discharge may be through a deluge as provided for Class "A" system, or into a tank of water, which shall be used for no purpose except ammonia absorption. At least one gallon of fresh water shall be provided for every pound of ammonia in the system. The water used shall be prevented from freezing without the use of salt or chemicals. The tank shall be substantially constructed of not less than one-eighth (⅛) inch of No. 11 U. S. gauge iron. No horizontal dimension of the tank shall be greater than one-half (½) the height. The tank shall have a hinged cover, or, if of the enclosed type, shall have a vent hole at the top. All pipe connections shall be through the top of the tank only. The discharge pipe from the pressure-relief valves shall discharge the ammonia in the center of the tank near the bottom.

615. Any refrigerant harmful to health which is not readily apparent to a human sense, shall have added thereto a substance to make it so apparent, where the amount used in a system is in excess of six (6) pounds.

SECTION 700. OPEN FLAMES AND ELECTRICAL EQUIPMENT

701. No fire, flame or arc light will be permitted in a Class "A," "B," or "C" Machinery Room, in which a flammable refrigerant is used.

702. No major electrical equipment except the motors and control apparatus necessary to operate the refrigerating machinery, shall be permitted in a Class "A" or "B" Machinery Room using a flammable refrigerant. All starting equipment, including switches, automatic starters, and the like shall be of the oil immersed or enclosed type.

703. All Class "A" and "B" systems using a flammable refrigerant shall have an emergency switch controlling all of the electrically operated refrigeration machinery, or the remote control of such a switch located outside of the machinery room, where it can be quickly and speedily reached and operated in cases of necessity.

SECTION 800. SUPERVISION

801. Every Class "A," "B," and "C" refrigeration system, unless automatic, shall be in charge of a person competent to operate the apparatus.

802. Any refrigeration system, when operating for exhibition purposes, shall be in charge of a makers' or owners' representative, who shall be responsible for its safe operation.

SECTION 900. VENTILATION

901. All machinery rooms for Class "A," "B," "C," or "D" systems shall be provided with means for adequate ventilation to the outer air. The ventilation shall consist of a window or windows opening directly to the open air, or mechanical means capable of exhausting the foul air from the room.

902. When a window or windows are used, if placed in opposite walls so as to provide a thorough air circulation to the outer air, a total area of inlet and outlet, respectively, of not less than specified in column D of the following table shall be provided. When a window or windows are placed in one wall, a total area shall be provided not less than that specified in column E of the following table:

Lbs. of Refrigerant in System	Mechanical Ventilation: Cu. Ft. per Minute Discharge	Mechanical Ventilation: Sq. Ft. Duct Area	Window Area in Sq. Ft.: For Each Opposite Side	Window Area in Sq. Ft.: For One Side Only
A	B	C	D	E
Up to 20	150	¼	1	6
50	250	⅓	1½	12
100	400	½	2	16
150	550	⅔	2½	19
200	680	⅔	3	25
250	800	1	3½	29
300	900	1	4	32
400	1,100	1¼	4½	38
500	1,275	1¼	5	42
600	1,450	1½	6	45
700	1,630	1½	6½	48
800	1,800	2	7	51
900	1,950	2	7½	55
1,000	2,050	2	8	59
1,250	2,350	2¼	9	68
1,500	2,800	2½	11	78
1,750	3,150	3	12½	87
2,000	3,500	3½	14	95
2,500	4,150	4	16	113
3,000	4,500	4½	18	130
4,000	6,000	6	24	167
5,000	7,500	7½	30	204
6,000	9,000	9	36	241
7,000	10,000	10.5	42	278
8,000	12,000	12	48	315
9,000	13,000	13	52	342
10,000	14,000	14	56	360
12,000	17,000	17	68	425
14,000	19,000	19	75	470
16,000	22,000	22	86	540
18,000	24,000	24	92	580
20,000	26,500	26	100	630
25,000	33,000	33	121	760
30,000	39,000	39	142	870
35,000	44,000	44	155	940
40,000	51,000	51	176	1,060
45,000	56,000	56	190	1,120

903. When mechanical means are used they shall consist of a power driven exhaust fan of the enclosed cased blower type which shall be capable of removing from the refrigerating machinery room the amount of air specified in column B of the above table. The inlet to the fan shall be located near the refrigerating equipment. The outlet from the fan shall terminate not less than twelve (12) feet above grade and in no case under a stairway or fire escape, or below and within 12 feet of any window. Where air ducts are used on either the inlet or discharge side of the fan they shall each have an area not less than that specified in column C of the above table. Sharp bends in the run of the ducts shall be avoided. The control for mechanical ventilation shall be easily accessible and located outside of the refrigerating machinery room.

NOTE.—Door openings leading directly to the open air shall be considered equivalent to windows for the requirements specified in column "D" and "E" of this table.

904. Where a non-irritant or non-flammable refrigerant is employed, the requirements as given in above table may be reduced by one-half. When air or water is employed as the refrigerant no ventilation shall be required.

905. In lieu of mechanical means of ventilation in refrigerating machinery room or rooms where a Class "A" system or a Class "B" system using ammonia is installed, a water deluge may be provided which shall consist of a sprinkler system having open heads of not less than one-quarter (¼) inch orifice spaced not more than eight feet apart in any direction and such system shall be located above all the refrigerating apparatus and piping in the refrigerating machinery room. Not more than one head shall be installed on a ¾ inch pipe; five heads on a 1 inch pipe; six heads on a 1¼ inch pipe. The deluge system shall be permanently connected with the main house supply or other assured source from which a constant water pressure of not less than twenty pounds per square inch can be maintained on the inlet side of the main control valve or valves at all times. The control valve or valves for such water deluge system shall be manually operated, easily accessible and shall be labeled and located outside of the refrigerating machinery room.

SECTION 1000. OPERATING PRECAUTIONS

1001. At least two helmets or masks shall be provided with a Class "A" system which operates above atmospheric pressure.

1002. At least one helmet or mask shall be provided with a Class "B" system in which ammonia, sulphur dioxide or other irritant refrigerant is used.

1003. Only helmets or masks that have been approved by the United States Bureau of Mines as suitable for the refrigerant employed shall be used, and they shall be kept in operative condition in an easily accessible case or cabinet located immediately outside the entrance to the machinery room.

1004. Every owner of every Class "A," "B" or "C" system, or of every Class "D" or "E" remote system shall conspicuously post as near as practicable to the pressure imposing element of such system a card giving amount of refrigerant charge, operating directions and precautions to be observed in case of a breakdown or leak, including the following:

(1) Instructions for shutting down system in case of emergency.

(2) The name, address and telephone number of every engineer and operator in charge.

(3) The name, address and day and night telephone numbers for service.

(4) The location of the nearest fire alarm box.

(5) The name, address and telephone number of the physician or hospital to be called in case of emergency.

1005. Every system shall have the name of the refrigerant used printed on or affixed in a permanent manner thereto as follows:

(1) Class "A" and "B" systems:
  (a) The pressure imposing element or piping adjacent thereto.
  (b) The liquid receiver.
  (c) Every shell type apparatus and evaporator not in a refrigerated space.
  (d) On the door or adjacent thereto of every refrigerated space, cabinet or box containing an evaporator.

(2) Class "C" systems:
  (a) The pressure imposing element, condensor or receiver, or any one of these when assembled as a unit.
  (b) Refrigerant lines.
  (c) On the door or adjacent thereto of every refrigerated space, cabinet or box containing an evaporator.

(3) Class "D" and "E" systems:
  (a) On the door or adjacent thereto of every refrigerated space, cabinet or box containing an evaporator.

1006. Refrigerant not contained in the refrigeration system shall be stored in cylinders conforming to the regulations prescribed by the Interstate Commerce Commission for the transportation of such refrigerant, or containers of equal strength, and shall be stored either in the machinery room or in the open air.

1007. When the refrigerant is withdrawn from system it shall be discharged only into a suitable absorbent or storage container.

1008. Containers shall not be connected to the system except during period of charging or withdrawing the refrigerant.

1009. No receiver, container or cylinder shall contain a greater proportion of liquid than is allowed in shipping containers.

1010. Tightening of bolts or flanged joints when under pressure is prohibited.

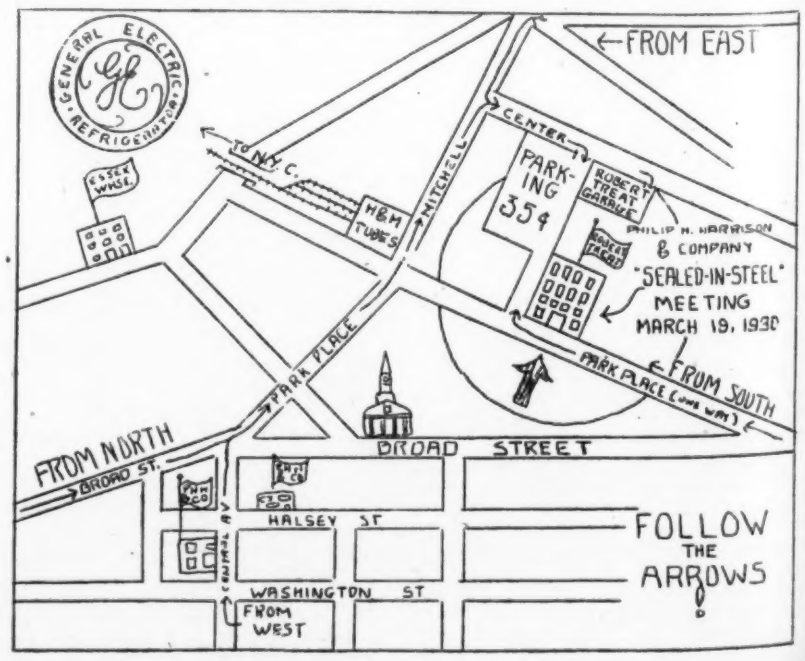
ICE MEN TO FIGHT FOR LOST COMMERCIAL TRADE

THE ice man is going to make a great effort to regain some of the lost commercial trade, according to Robert McKnight, in an address given at the twenty-third annual convention of the Illinois Association of Ice Industries. Mr. McKnight discussed advertising plans which will be carried out by the industry this year.

Everything is in preparation for the advertising activity, seasonable appeals for the months extending from June to September are being prepared for the billboard campaign, and designs for direct mail pieces have been approved and will be ready for use during the month of April. Mr. McKnight reported that at a conference held recently with furniture dealers and refrigerator manufacturers there was a unanimous feeling expressed to co-operate in every way with the ice companies.

Several speakers who followed Mr. McKnight were of the opinion that the advertising from now on should be of a more militant nature.

How Harrison Guides Dealers to the Convention



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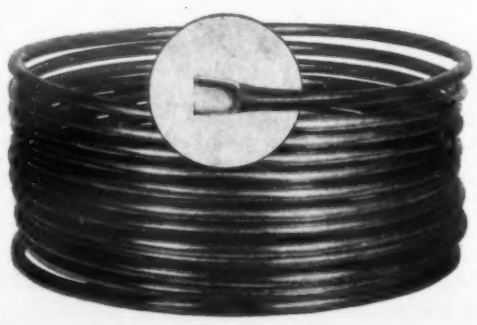

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Latest Models and Prepare for Banner Sales Year in Atlantic Seaboard Cities

SERVICE MANAGERS

(Concluded from Page 2, Column 5)

problems in the field, even after as much as five years of practical experience. Also, that he does not, if left alone, stand still. It takes a certain amount of constant teaching to even keep him from going backward, because as fast as you give him something new he loses something old which he is not using for the time being. To make him go ahead takes real effort constantly applied."

Others who spoke briefly were H. Newcomb, Copeland service manager; Herman F. Lehman, service manager of Frigidaire, and F. W. Brack, advertising manager ELECTRIC REFRIGERATION NEWS.

Before the service program began, Glenn Muffly, president of the Detroit Section of the A. S. R. E., and C. F. Belshaw, secretary, called the attention of those present to the annual meeting of the Society at Atlanta, Ga., May 7, 8 and 9. Plans are being made for special cars from Detroit, with a stop-over at Chattanooga.

The closing speaker was F. M. Cockrell, publisher of ELECTRIC REFRIGERATION NEWS, who emphasized the fact that several of the speakers had referred to the service department as very close to the sales department. He pointed out that sales and service should go hand in hand, that both have like duties in bringing about consumer acceptance of the product. He urged a fuller recognition of this fact by manufacturers.

Among those in attendance were a number of men from other cities. The list follows:

Wm. E. Arndt, Detroit; Edward Barger, Copeland Products, Inc., Mt. Clemens, Mich.; N. K. Baxter, Westinghouse Electric & Mfg. Co., Mansfield, O.; C. F. Belshaw, Geo. B. Bright Co., Detroit; F. W. Brack, ELECTRIC REFRIGERATION NEWS, Detroit; Roger K. Braun, Kelvinator Corp., Detroit; B. A. Brown, Delco Products Corp., Dayton, Ohio; Henri A. Brysselbout, Copeland Products, Inc., Detroit; J. R. Cameron, Norge Corp., Detroit; F. M. Cockrell, ELECTRIC REFRIGERATION NEWS, Detroit; Hursle E. Cossin, Kelvinator Corp., Detroit; C. W. Coye, Alaska Refrigerator Corp., Muskegon, Mich.; Vernon W. Crone, Detroit; R. C. Doremus, Geo. B. Bright Co., Detroit; A. F. Dietz, Arctic Dairy Products Co., Detroit; W. C. Dever, Whitehead & Kales, River Rouge, Mich.; James H. H. Downs, Detroit; Don G. Ellis, Kelvinator Corp., Detroit; Fred R. Erbach, Kelvinator Corp., Detroit; A. R. Green, General Electric Co., Cleveland; Sidney J. Harry, Redford, Mich.; I. C. Hartzell, Frigidaire Corp., Dayton, O.; Harry C. Hayes, Absopure, Detroit; E. F. Hubacker, Norge Corp., Detroit; B. S. Hyatt, Copeland Products, Inc., Detroit; W. Jabine, ELECTRIC REFRIGERATION NEWS, Detroit; Earl B. Jennings, Arctic Dairy Products Co., Detroit; James A. Kane, Universal Cooler Corp., Detroit; J. L. Lamb, Whitehead Refrigeration Co., Detroit; Wilhelm Larsen, Toledo; Herman F. Lehman, Frigidaire Corp., Dayton, O.; J. P. Lindsay, Universal Cooler Corp., Detroit; Wm. Maclean, Westinghouse Electric & Mfg. Co., Detroit; E. Martin, Detroit; J. H. McKeagne, Zerozone Corp., Chicago; E. E. Van Evan, Frigidaire Sales Corp., Detroit; A. D. McLay, The Detroit Edison Co., Detroit; J. W. Moon, Alaska Refrigerator Corp., Muskegon, Mich.; Glenn Muffly, Copeland Products, Inc., Mt. Clemens, Mich.; Emmet J. Mueller, Detroit; Owen F. Nelson, Copeland Products, Inc., Mt. Clemens, Mich.; R. G. Nelson, Rice Products, Detroit; F. W. Neverman, Arctic Dairy Products, Detroit; H. Newcomb, Copeland Products, Inc., Mt. Clelmens, Mich.; R. Northrop, Copeland Products, Inc., Mt. Clemens, Mich.; F. A. Oberheu, United Motors Service, Detroit; C. L. Olin, Servel Sales, Inc., Evansville, Ind.; T. S. Pendergast, Absopure, Detroit; H. I. Phillips, Flintlock Corp., Detroit; Donald J. Parry, Detroit; V. C. Rice, Norge Corp., Detroit; T. W. Richman, Detroit; P. H. Rutherford, Delco Products Corp., Dayton, O.; D. C. Schomp, Absopure, Detroit; H. L. Spencer, Norge Corp., Detroit; J. Fred Stoliker, Truscon Steel Co. of Canada, Walkerville, Ont.; J. H. Stoliker, Universal Cooler Co. of Canada, Windsor, Ont.; Geo. Sutphen, Kelvinator Branch, Detroit; Glenn Taylor, Kelvinator Sales Branch, Detroit; Alexander T. Taft, General Electric Co., Cleveland; Geo. M. Troup, Frigidaire Corp., Dayton, O.; J. A. Vassar, Westinghouse Electric & Mfg. Co., Mansfield, O.; Hugh Walters, Norge Corp., Detroit; E. F. Wiesenhoefer, Copeland Products Co., Mt. Clemens, Mich.; Daniel D. Wile, American Radiator Co., Detroit; C. V. Williams, Delco Products Corp., General Motors Bldg., Detroit.

CHICAGO CODE

(Concluded from Page 1, Column 5)

their belligerent attitude toward the distinguished guests, but only provoked a blaze of aldermanic oratory in which each of the questioners took occasion to justify his position. One of the speakers consoled the visitors by explaining that there was nothing unusual in the proceedings and that "they should have been here when 'Brother' Fremont Wilson was on the stand last year."

Even Senator T. G. Essington, counsel for the local manufacturers' committee, departed from his usual suave and smiling manner to give Coroner Zisch a stiff grilling, craftily designed to bring out that the Coroners' Association and its committee (which reported favorably on the Kegel ordinance) had not really made a thorough study, as was claimed, of all the proposed legislation affecting refrigeration.

At one point it appeared momentarily that Senator Essington had successfully impeached the testimony of Captain McGonegal by invoking the almanac. While in the midst of his talk, Captain McGonegal was handed a telegram which he read aloud. It announced that Washington, D. C., had officially passed its refrigeration code. Senator Essington apparently suspected that the telegram had been introduced for dramatic affect and demanded to know if Captain McGonegal had seen it previously. The Washington representative answered "No," and thereupon the attorney suggested that the date of the telegram be inspected. In the meantime the message had been handed to one of the aldermen, who announced that it was dated "December." The startled alderman gathered around, only to discover that the abbreviation "DC" meant District of Columbia and not December. In time the excitement died down and the visiting witnesses each received a vote of thanks for attending the meeting and adding to the enlightenment of the Chicago officials on the subject of refrigeration.

Interest was immediately revived, however, when John Usher, Chicago refrigeration man and chairman of the original industry committee which was called to take charge of the situation when trouble started last summer, arose to voice objections to the code provisions agreed upon by the large manufacturers. He charged that the executives of the big companies, located outside of Chicago, had met secretly in a hotel the previous day and had arrived at a compromise agreement which would have the effect of putting the Chicago industry out of business. The local committee had met, he said, at the headquarters of the Electric Association but had been forced to delay proceedings due to the absence of members representing the big companies. These companies, he explained, were those which belonged to NEMA (the National Electrical Manufacturers' Association). When the representatives of these companies arrived at the meeting, it was found that they had already decided the principal point of dispute, namely, the amount of refrigerant to be permitted in an apartment house multiple system. The local companies in Chicago, he pointed out, all make systems using a larger quantity of refrigerant then would be permitted by the newly revised code, and that it would, therefore, result in throwing hundreds of Chicago men out of employment.

It soon developed that there was a completely new alignment among the various opposing interests. Certain individuals who had invariably been on opposite sides of every argument in the past now appeared to be in harmony, while others who had worked hand in glove together were now in opposition. The aldermen were perplexed and stopped the game until the crowd could "choose up sides" and select new batteries for each team. The spotlight was now turned to the new code agreed upon by the NEMA manufacturers. E. T. Williams, of Servel, who had long been the lone dissenter in the NEMA group, announced that the new code met with his approval. Dr. Kegel reaffirmed his willingness to accept the NEMA specifications on the basis that they incorporate his safety principle. Senator Essington maintained his stand that the industry committee which he represented was still in favor of the resolution submitted last August 14th, which recommended the Gearon ordinance.

Gerald Gearon contended that his ordinance should be adopted, and was supported by T. C. McKee, president of the Chicago Section of the Refrigerating Machinery Association. A. H. Goetz, of the Brunswick-Kroeschell Company and president of the National Refrigerating Machinery Association, announced that the new code sponsored by the NEMA group did not meet with the approval of the local manufacturers. Glenn Muffly, of Copeland, and chairman of the Technical Committee of NEMA, expressed surprise that Dr. Kegel agreed to the new code, while Mr. Gearon opposed it, since he considered it really closer to the Gearon ordinance than the Kegel ordinance. Mr. Muffly pointed out that New York City and Chicago are the only cities large enough to have miles of apartment buildings, which make a special problem for refrigeration, and in the solution of this problem the two cities have gone in exactly opposite directions. In New York, the multiple system has been completely banned, while in Chicago the tendency has been toward very large multiple systems. He emphasized that the use of the multiple system has been a big factor in popularizing electric refrigeration because of its economy. Another important feature affecting apartment business has been quietness of operation. He stated, however, that there has been a great advance in the development of small individual units, which are now made to operate very quietly.

H. D. Edwards, of the Carbide Carbon and Chemicals Corp., New York City, and president of the American Society of Refrigerating Engineers (sponsor for the proposed national refrigeration code), stated that the American Standards Association will not approve a multiple system containing such quantities of refrigerant as are permitted by the Gearon ordinance. Mr. Edwards was called upon as an authority, because he has personally drafted the various recent revisions of the proposed national code which have been under consideration by the American Society of Refrigerating Engineers, the National Electrical Manufacturers' Association and the American Standards Association.

Other speakers added their bit to the uncertainty of the situation, until the committee were obviously in a fog as to what it was all about. Finally one of the aldermen made a fervent plea for the various factions to get together and agree upon some regulations which will be satisfactory to all.

VANDOREN ADVANCED BY FRIGIDAIRE CORPORATION

Dayton, Ohio—Activities of Frigidaire Corporation in the commercial refrigeration field have been centralized under one head, with the appointment of B. J. Vandoren as assistant sales manager in charge of commercial business. Mr. Vandoren entered the employ of General Motors in 1910 and was for a time with the Buick division. He became a member of the engineering department of the Delco-Light Company in 1918, and entered the sales department of Frigidaire in 1923 in the ice cream cabinet division. He has been closely associated with wholesale and retail sales of commercial refrigerating equipment since that time.

STONE & WEBSTER SALES SHOW GAINS LAST YEAR

Boston, Mass.—Sales of electric refrigerators during the first nine months of last year, according to a survey of a number of power companies just completed by Stone & Webster, Inc., were 10.3 per 1,000 home customers, compared with 8.31 in the same period in 1928. Other increases were electric irons, 44.2 against 41.2; percolators, 12.5 against 9.7; washing machines, 7 against 4; electric ranges, 13.5 against 9.9; waffle irons, 12 against 11.8; electric cookers, 8.6 against 5.6 and vacuum cleaners and floor polishers, 7.1 against 6. Miscellaneous appliances increased from 6.2 to 18.8.

The analysis was made by the Stone & Webster Service Corporation, a subsidiary of Stone & Webster, Inc., and applies to the operation of public utility properties which it supervises in fifteen states as well as in Canada, Mexico and the West Indies. All together, merchandise sales by electrical departments of the companies covered by the report amounted to 13.6 per cent of gross revenue from sales of electric energy during the first nine months of last year, against 12.7 per cent in the same period of 1928.

ELECTROLUX OKLAHOMA REPRESENTATIVE IS DEAD

Oklahoma City, Okla.—Alvin Thrasher, district manager for Electrolux Refrigerator Sales, Inc., in this territory, died here on March 5, following an operation for appendicitis. Mr. Thrasher was seemingly well along the road to recovery and the report of his untimely death came as a shock to his many friends in the refrigeration industry.

Mr. Thrasher has been with Electrolux several years and at the annual convention held at Evansville last November, he was awarded a prize for turning in the best franchise at the convention.

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Scientific and Historical Data of the Refrigeration Industry

A CLEAR explanation of the scientific laws on which mechanical refrigeration is based and the historical background of the refrigeration industry are given in the court proceedings in the famous

Frigidaire-Absopure Patent Suit

The complete proceedings of the trial, which took place at Bay City, Michigan, March 18-23, 1929, together with the official decision of Judge Tuttle, have been reprinted in a 48-page special supplement.

The expert testimony recorded in this document furnishes a most illuminating exposition of the various refrigeration processes and a valuable picture of the historical development of the industry.

The Supplement will be sent postpaid to any address for one dollar per copy. Remittance must accompany order.

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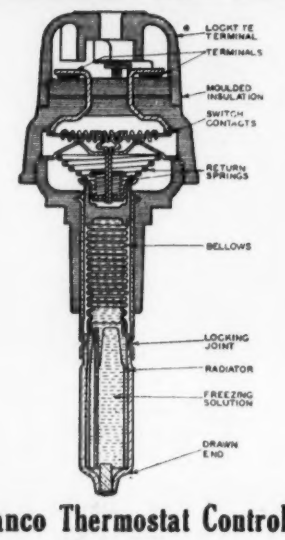

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New Patents Indicate Increased Activity

ISSUED FEBRUARY 25

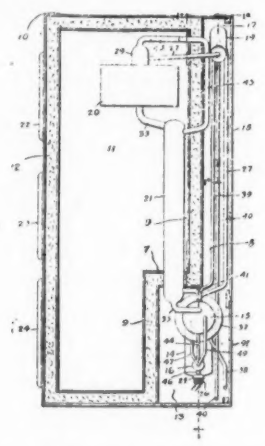
1,748,101—APPARATUS FOR USE IN THE MANUFACTURE OF ICE. Anson J. Bentley, Niles, Ohio. Filed May 29, 1924, Serial No. 716,540. Renewed Mar. 9, 1928. 15 Claims. (Cl. 62—157.)

1,748,121—CONDENSER FOR REFRIGERATING PLANTS. Norman H. Gay, Los Angeles, Calif. Filed Jan. 24, 1928. Serial No. 249,078. 5 Claims. (Cl. 257—35.)

1. In a condenser for a refrigerating plant, an inlet and an outlet header, a plurality of condensing pipes in multiple tube, a guide surrounding said tube, a traveler movably supported by said guide for movement concentrically thereof in a plane passing through the spool between its ends, means for rotating said guide, and means for supporting said tube.

1,748,155 — REFRIGERATION. Baltzar Carl von Platen and Carl Georg Munters, Stockholm, Sweden, assignors to Electrolux Servel Corporation, New York, N. Y., a Corporation of Delaware. Filed Mar. 17, 1927, Serial No. 176,026, and in Germany June 7, 1926. 4 Claims. (Cl. 62—119.5.)

1. Refrigerating apparatus comprising a cabinet having insulated walls defining a cooling space and other walls forming,



together with the insulated walls, an apparatus space, the apparatus space having a lower enlarged portion and an upper narrower portion, a generator, a liquid heat exchanger and an absorber in said lower enlarged portion, said liquid heat exchanger and said absorber being placed in a substantially horizontal position with the bottom of the absorber above the middle of the generator, means for circulating absorption liquid through said generator, liquid heat exchanger and absorber, a condenser in said upper narrower portion, an evaporator within the upper part of said cooling space, a gas heat exchanger extending vertically within said cooling space and conduits interconnecting the generator, condenser, gas heat exchanger and evaporator.

1,748,320—REFRIGERATED AGITATING DEVICE. George E. Wallis, Wenham, Mass., and John C. Scovel, Jr., Chicago, Ill., assignors to The Creamery Package Mfg. Company, Chicago, Ill., a Corporation of Illinois. Filed Sept. 24, 1926. Serial No. 137,417. 2 Claims. (Cl. 257—78.)

1. In a device of the class described, an agitator having front and rear walls marginally joined and centrally spaced to form a chamber therebetween, a hub supported in said front and rear walls and having a passage with a constricted front portion opening into said chamber adjacent said front wall and having an enlarged rear portion opening into said chamber adjacent said rear wall, a hollow shaft secured to said hub for operative support of said agitator and having communication with the enlarged portion of said passage and a stationary tube positioned within said shaft having a fluid tight bearing in the constricted front portion of said passage and communicating therewith.

1,748,324—REFRIGERATED CONTAINER. Chester A. Baker, Omaha, Nebr., assignor to Baker Ice Machine Co., Inc., Omaha, Nebr., a Corporation of Nebraska. Filed Oct. 6, 1928. Serial No. 310,812. 8 Claims. (Cl. 62—92.)

1. A refrigerating device of the character described, a refrigerant-containing chamber, a container chamber located below the first named chamber and having vertical guides for spacing the container from the chamber walls and forming vertical channels for gravity movement of refrigerant fluid through said channels, and means including a tube communicating with the lower end of the cooling chamber for passage of fluid from the channels.

1,748,385—REFRIGERATED AGITATING DEVICE. Olaf Larsen, Fort Atkinson, Wis., assignor to The Creamery Package Mfg. Company, Chicago, Ill., a Corporation of Illinois. Filed April 13, 1929. Serial No. 354,840. 3 Claims. (Cl. 259—103.)

1. A device of the class described comprising a rotatable cooling drum, a stud mounted axially upon the face of said drum, a hub detachably secured to said stud, and a plurality of radial blades mounted on said hub in spaced relation to the face of said drum.

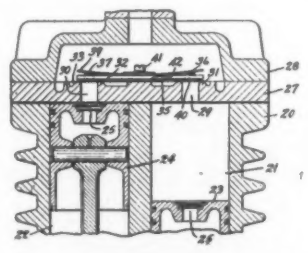
1,748,401—REFRIGERATED AGITATING DEVICE. John C. Scovel, Jr., Chicago, Ill., assignor to The Creamery Package Mfg. Company, Chicago, Ill., a Corporation of Illinois. Filed Feb. 9, 1928. Serial No. 252,954. 5 Claims. (Cl. 259—107.)

1. In combination, a liquid container, an agitator positioned in said container and having an enclosed chamber, a shaft operatively supporting said agitator and having passages therein communicating with said chamber for the flow of refrigerant fluid to and from said chamber, said shaft extending through a wall of said container, a journal sleeve mounted on said shaft in spaced relation thereto, and a bearing block mounted in a wall of said container and operatively supporting said journal sleeve.

1,748,434 — REFRIGERATING APPARATUS. Neil B. Wolcott, Washington, D. C., assignor to Thermo-Ice Corporation, Auburn, N. Y. Filed Feb. 8, 1927. Serial No. 166,662. 8 Claims. (Cl. 62—118.)

1. A refrigerating apparatus including a cylindrical receptacle constructed and compartment, a lower condenser comarranged to provide an upper generator partment, and a receiver compartment, a gas pipe leading from the top of the generator and formed into a coil in the condenser compartment and leading thence to the receiver compartment.

1,748,531 — REFRIGERATING APPARATUS. George M. Troup, Dayton, Ohio, assignor by mesne assignments to Frigidaire Corporation, a Corporation of Delaware. Filed May 2, 1925. Serial No. 27,373. 13 Claims. (Cl. 251—119.)

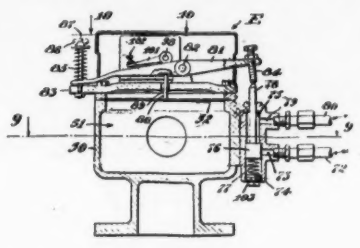


1. Valve apparatus comprising, in combination, a valve seat, a flap valve cooperating with said seat, a spring, a member disposed between said valve and spring whereby said valve is normally held on the seat through the action of said spring and a guide for said member, interposed between the valve and spring.

1,748,570—REFRIGERATOR AND THE LIKE. Herbert H. Hillman, Grand Haven, Mich., assignor to Challenge Refrigerator Company, Grand Haven, Mich., a Corporation of Michigan. Filed Sept. 17, 1927. Serial No. 220,228. 4 Claims. (Cl. 217—17.)

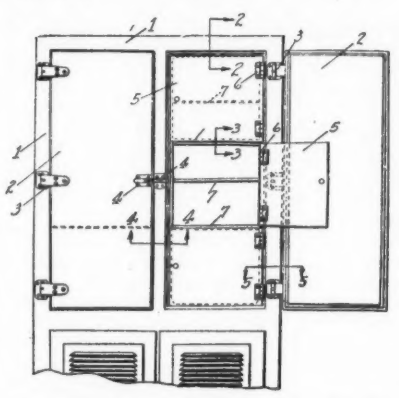
1. In a structure of the character described: a body having a front, a back, opposite sides and a top provided with a keeper; side casing members having inwardly offset top edge and front edge portions and rear flanges secured to said back; a front casing member having an inwardly offset top edge portion and lateral rearwardly extending flanges engaging the inwardly offset front edge portions of the side casing members; a top casing member having, on its under side and within its hereinafter-mentioned flange, a catch engaging the keeper and a downwardly extending flange engaging the inwardly offset top edge portions of the side casing members and of the front casing member, and secured to said back.

1,748,669—REFRIGERATING MACHINE. John Hilton Brown, Hollywood, Calif., assignor, by mesne assignments, to Instant-Ice Corporation, a Corporation of Delaware. Filed Aug. 6, 1925. Serial No. 48,476. 1 Claim. (Cl. 62—2.)



In a refrigerating apparatus having a compressor, an expansion valve associated with the compressor, a water cooled condenser communicating with the compressor, a chamber having headers establishing communication with the expansion valve and condenser, and pressure responsive means disposed within said chamber above the headers aforesaid and operable by variation of the pressure of the refrigerant in said chamber to vary the flow of the water for cooling said condenser.

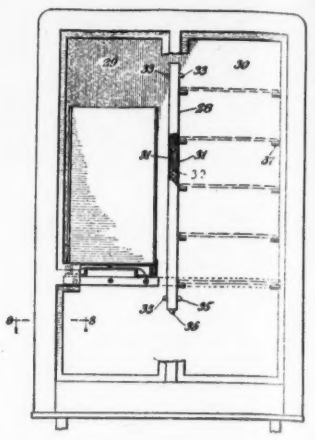
1,748,670—REFRIGERATOR. John D. Craft, Evansville, Ind. Filed June 6, 1927. Serial No. 196,689. 3 Claims. (Cl. 62—31.)



1. In combination with a casing having a refrigerating enclosure, means subdividing the refrigerating enclosure into a plurality of compartment doors forming closures for the compartments, and said casing having an opening through which all of said compartments may be exposed, and a closure for said opening independent of the compartment closures, and resilient means carried by the compartment doors adapted to be engaged by the opening closure substantially at its closed position whereby closing of the closure will close the compartment doors.

1,748,716—REFRIGERATOR BOX. Jack Carl Jankus, Scranton, Pa., assignor to Gas Refrigeration Corporation, Dover, Del., a Corporation of Delaware. Filed Mar. 17, 1926. Serial No. 95,189. 4 Claims. (Cl. 62—51.)

1. A refrigerator casing having a removable vertically disposed partition extending from the front to the rear thereof, guide pins carried by the lining upon opposite sides of said partition for engaging with the latter and preventing lateral movement thereof, and a supporting member also carried by said casing and upon which said partition rests, said partition being removable from the casing upon the vertical movement of the partition to bring the lower end thereof above the lower guiding pins.



1,748,843 — REFRIGERATOR SHELF. Herbert Kuckel, New Orleans, La. Filed Apr. 13, 1929. Serial No. 354,938. 5 Claims. (Cl. 312—176.)

1. In a receptacle having walls and shelving, supporting means for the shelving, detachably connected with the walls, comprising supporting rods removably interlocked at one end in the walls, the opposite ends of the rods being free, tubular members fastened to the shelving for telescopically co-operating with the supporting rods.

GET TEST FACTS
and get all of them!

We feel you are entitled to know just what happens to your refrigerator from its receipt until it goes out the back door.

Complete records, work sheets, everything concerning the test, are open to your inspection.

GEORGE B. BRIGHT CO.
Refrigerating Engineers & Architects
2615 12th St., Detroit

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IN THE VERY HEART OF DETROIT

THE TULLER is the headquarters for tourists and travelers. Delightfully furnished, homelike atmosphere. Abundance of air and sunshine, large, spacious lobbies and lounging rooms. Famous for our restaurants.

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ROOMS WITH BATH
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Facing Grand Circus Park
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REFRIGERATION RUBBER WARE
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MADE TO YOUR SPECIFICATIONS. SEND US YOUR BLUE PRINT — WE WILL SEND YOU OUR PRICES.
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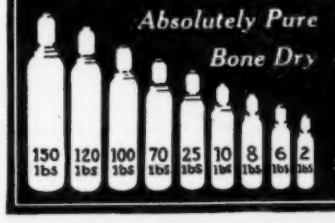
196 MILWAUKEE STREET, MILWAUKEE, WISCONSIN

Every Cylinder Analyzed
Absolutely Pure
Bone Dry



SULPHUR DIOXIDE
for DIRECT CHARGING
also Ton Drums Tank Cars
ANSUL CHEMICAL COMPANY
MARINETTE WISCONSIN

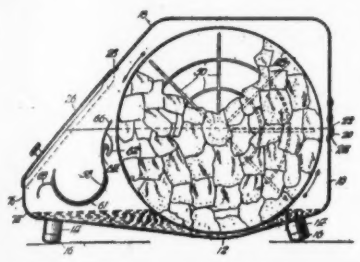
in the Refrigeration Industry

ISSUED MARCH 4

1,748,957—REFRIGERATION. Donald B. Knight, Brooklyn, N. Y. Filed May 24, 1928. Serial No. 280,139. 3 Claims. (Cl. 62—179.)

2. The process of refrigerating which comprises evaporating a liquid-cooling agent of relatively low vapor pressure in the presence of an auxiliary agent inert to the cooling agent and at substantially atmospheric pressure and having a specific weight lower than the specific weight of the vapor of the cooling agent, producing a head due to difference in specific weights, forcing the mixture of the vapor of the cooling agent and auxiliary agent under the influence of the head produced into the presence of an absorption liquor at substantially atmospheric pressure, segregating the cooling agent from the auxiliary agent by absorption, and returning the auxiliary agent into the presence of the cooling agent under the influence of the head product.

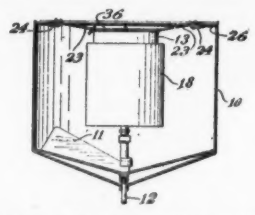
1,748,963—APPARATUS FOR DISPENSING FRESHLY REFRIGERATED FOODS. Ernest C. Styberg, Racine, Wis., assignor to The Instant Freezer Corporation, Racine, Wis., a Corporation of Wisconsin. Filed Aug. 25, 1927.



Serial No. 215,339. 4 Claims. (Cl. 257—98.)

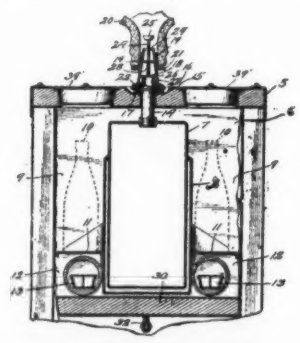
4. An instant freezer comprising a main housing having its bottom formed into a tray for holding a liquor charge, a handle on top of said freezer behind the center of gravity, a lip at the front end of said tray over which the liquid in the tray can be poured out, supporting feet projecting from said tray, the front feet being positioned near said lip to remain in contact with a flat support during tipping of said freezer until said feet and lip are substantially under the center of gravity.

1,749,067—ICE-CREAM-FREEZING ATTACHMENT FOR WASHING MACHINES. Clifford Elbridge Cole and Basil W. McGinnis, Birmingham, Ala., assignors, by mesne assignments, to Nineteen Hundred Corporation, Binghamton, N. Y., a Corporation of New York. Filed Oct. 14, 1927. Serial No. 226,107. 12 Claims. (Cl. 259—53.)



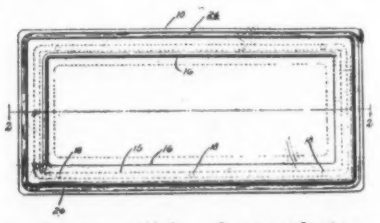
1. An ice cream freezing attachment for a washing machine having a vertically disposed stationary tub, open at the top, an agitator in the bottom of the tub and means to impart rotary motion to the agitator, comprising an ice cream freezer having a stationary brine tank and a rotary cream receptacle within the brine tank and arranged concentrically therewith, radially arranged supporting means connecting the brine tank with the walls of the tub and so disposed as to position the brine tank substantially concentric with respect to the axis of rotation of the agitator and above the agitator, coupling means provided on the cream receptacle, power transmitting means coacting with the coupling means and extending through the bottom of the brine tank, and means for detachably connecting the power transmitting means

1,749,194—WATER COOLER. Victor T. Schmitt, Chicago, Ill., assignor to Hinckley & Schmitt, Chicago, Ill., a Corporation of Illinois. Filed Apr. 15, 1929. Serial No. 355,255. 3 Claims. (Cl. 62—44.)



1. In combination a water cooler comprising a casing, a water storage tank in said casing, a pipe extending vertically through said casing, supply means arranged outside of said casing, a washer arranged about said piping, a valve casing having its lower end resting on said washer, a normally closed spring-pressed valve in said casing for establishing communication between said tank and said supply, and means for maintaining said valve in open position when the supply means and tank are in proper operating position.

1,749,336—REFRIGERATOR DOOR OF MOLDED ASPHALT COMPOSITION. Harvey D. Geyer, Dayton, Ohio, assignor to The Inland Manufacturing Company, Dayton, Ohio, a Corporation of Delaware. Filed Mar. 9, 1927. Serial No. 174,085. 4 Claims. (Cl. 20—35.)



1. As an article of manufacture, a heat insulating door for refrigerator cabinet, comprising: a relatively thick section panel frame and a relatively thin panel integrally molded of a heat insulating bituminous composition comprising hard asphalt, a flux of lower melting point, asbestos fiber and an inert filler to form an interior recess of substantial depth, an inner metal lining secured to the inner surface of said frame to thereby form a closure for said interior recess, and heat insulating material filling said recess.

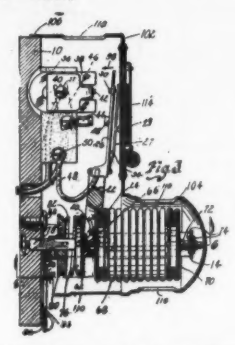
1,749,337—WATER-COOLED CABINET. Harvey D. Geyer, Dayton, Ohio, assignor to The Inland Manufacturing Corporation, Dayton, Ohio, a Corporation of Delaware. Filed Aug. 29, 1927. Serial No. 216,115. 6 Claims. (Cl. 220—9.)

1. In a water cooler, a metal water tank having an open top, separate molded panels enclosing said tank and forming a cabinet surrounding and supporting said tank, said molded panels having thickened margins mutually abutting each other and the corners of said tank, heat insulating material filling the space between the panel walls and tank walls, and a removable heat insulating top having a flange resting upon the top edges of the side panels.

1,749,343—COOLING OR REFRIGERATING STRUCTURE. Earl F. Hersh, McAllen, Tex. Filed Nov. 6, 1928. Serial No. 317,662. 5 Claims. (Cl. 98—32.)

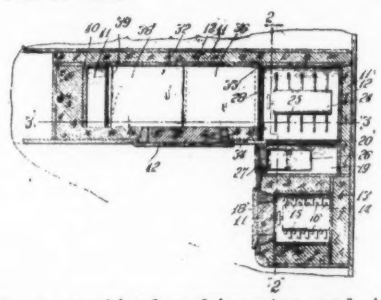
1. A cooling structure having an insulating floor, an outer wall, an outer roof, an inner wall extending upward from the floor and spaced from the outer wall, an inner roof associated with the inner wall to thus provide an air circulating space between the outer and inner walls and the outer and inner roofs, a chamber into which said space opens having louvres, ventilators disposed in the floor and ventilating pipes extending up from the inner roof and extending exteriorly to the outer roof and having a damper.

1,749,392—TEMPERATURE CONTROL SWITCH STRUCTURE. Albert Penn, Des Moines, Iowa, assignor to Penn Electric Switch Co., Des Moines, Iowa, a Corporation of Iowa. Filed Mar. 10, 1928. Serial No. 260,796. 12 Claims. (Cl. 200—140.)



1. A structure of the character disclosed comprising a stationary contact, a yoke, a movable armature pivoted thereto, a contact carried by said armature and adapted to engage the stationary contact when the armature is in one position of its movement, a magnet, said armature being in close proximity to said magnet when in such position whereby a snap action switch is provided, a bellows having one end anchored to said yoke and its other end acting upon said armature for moving it in one direction and a spring opposing the action of said bellows.

1,749,484—COMBINED REFRIGERATOR AND ICE CREAM CABINET. Charles G. Juneau, deceased, Wauwatosa, Wis., by Anna K. Juneau, Wauwatosa, Wis., administratrix, and Walter C. Marshall, Milwaukee, Wis. Filed May 25, 1928. Serial No. 280,538. 3 Claims. (Cl. 62—89.)



1. A combined refrigerator and ice cream cabinet provided with insulated top, bottom and side walls, an insulated chamber provided with a refrigerating unit provided with loop-coils arranged intermediate of the front and rear walls, ice cream holding containers arranged within the loops of said coils, a second refrigerating unit chamber spaced from the first mentioned chamber, a chilling compartment arranged intermediate of the two chambers, air passages between the bottom and top of said compartment and said second chamber, said compartment having outwardly moving doors, and ice-cube holding vessels carried by said doors.

MR. ELHINNY TALKS TO COPELAND DEALERS

Tulsa, Okla.—The annual regional sales convention of Copeland dealers and distributors was held here March 10 and 11. Representatives from Missouri, Kansas, Arkansas and Oklahoma were in attendance.

W. D. McElhinny, vice-president, in charge of sales and five other factory men presided at the two luncheons and the banquet. Classes in salesmanship and service were held.

The Alvin hotel was headquarters for the convention. The local arrangements were in charge of George Mahaffey, general manager of the Tulsa Copeland outlet.

ALLEN-BRADLEY HAS NEW STARTING SWITCH

THE Allen-Bradley Company, 286 Greenfield Avenue, Milwaukee, Wisconsin, announce the Bulletin 707 single phase starting switch for motors operating refrigerating machines, compressors, pumps, oil burners and other motor-driven devices governed by either two-wire or three-wire control.

It is a double-pole magnetic switch with thermal overload relay and has a maximum rating of 1½ hp., 110 volts, and 3 hp., 220 volts. A feature of this starting switch is the operating coil which has a double winding for series-parallel connections permitting the switch to be used interchangably up to and including 1½ hp. for 110 or 220-volt motors by simply changing the terminal connections of the operating coil. This innovation increases the flexibility of the switch and reduces the number of switches to be carried in stock to meet normal requirements. It can be furnished with start and stop push buttons in the cover, without push buttons, and with two-way lever switch.

KELVINATORS GO "AYACHTING"

New York, N. Y.—Two prominent New Yorkers have installed Kelvinators on their yachts. The "Sago," owned by C. S. Payson, and the "Colema," owned by J. S. Bache, are the yachts in question. The equipment on the "Sago" consists of 1-4050 tank, two fins, 1 F compressor, thermostat and expansion valve.

Equipment on the "Colema" in its dining salon consists of one air-cooled compressor, 1—1520 dry system tank. The refrigerator has Monel metal interior. Its exterior is rosewood, to match the wood finish of the dining salon.

These sales were made by C. J. Purdy, marine salesman of the New York Kelvinator branch.

TUBE-TURNS, INC., NAMES THREE DISTRIBUTORS

Louisville, Ky.—Appointment of the E. F. Keating Co., 452 Water Street, New York City; Himelblau-Agazim & Co., 30 North Dearborn Street, Chicago, Ill., and Stewart Machinery Co., Buder Building, St. Louis, Mo., as distributors, is announced by Tube-Turns, Inc., of Louisville.

Each of these companies will carry complete stocks of Tube-Turns in 45°, 90° and 180° types. Tube-Turns are seamless drawn, short radius fittings for pipe welding.

It also was announced that W. P. Curley and A. L. Breyvogel will continue as managers of the New York and Chicago branch offices, respectively.

SEATTLE UTILITY SHOWS NEW COPELANDS

Seattle, Wash.—The new Copeland models are now being displayed by the City Light Department, the municipal owned utility here. J. D. Ross, superintendent, is preparing for spring sales activity.

Besides being on display at the sales rooms in the City Hall, the new models are also being shown at all the branch stores.

WILL REPRESENT SERVEL IN BIRMINGHAM, ALABAMA

Birmingham, Ala.—The Louis Pizitz Company, one of the largest department stores in Birmingham, Alabama, was recently appointed dealer for Birmingham and distributor for the north Alabama territory for the Servel electric refrigerator. The Pizitz Company has obtained the services of several well-known refrigeration experts. Both the commercial and domestic lines of Servel refrigerators will be offered in Birmingham at once.

HANDY & HARMAN Silver Solders QUALITY SERVICE

A Safety Measure that pays Dividends

By welding, brazing or soldering all joints and connections that must be permanently gas-tight with

"HANDY" SILVER SOLDERS

1. You *insure* yourselves against possible serious trouble with "gas-leaks."
2. You comply with the most drastic local ordinances.
3. You give your dealers a strong talking point.
4. You are quite likely to reduce manufacturing costs, because of the greater speed with which silver solders may be applied.

Send for our new Bulletin No. 3ER and other technical literature useful to the refrigerator builder.

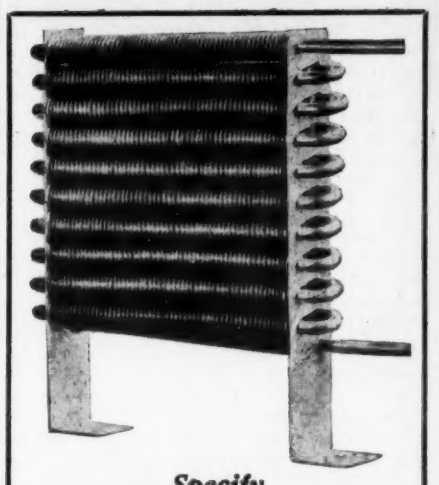
Handy & Harman
57 William St.
New York City

For Automatic Refrigeration Manufacturers

Whatever you require in copper, brass, bronze, or copper alloys, we are prepared to furnish on contract either parts or sub-assemblies ready for installation in your unit. Boilers, compression nuts, filters, floatballs, condensers, special nipples, bellows and thermostats, and a large variety of other standard parts. Let us quote on your requirements.

BRIDGEPORT BRASS CO.
General Offices and Plant
Bridgeport, Conn.
Offices in Principal Cities
"Bridgeport" BRASS TRADE MARK CO.

KING ZEERO
SAFETY COOLING UNITS
EVAPORATORS
for Single or Multiple, Methyl or Sulphur
Over 3,000 in operation in Chicago, ranging from 1 to 106 per compressor
BRINE
CIRCULATION UNITS, *All Steel*
Tested 125 lbs. air pressure
MORRISON MFG. CO.
2315 Wolfram St., CHICAGO, ILL.



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ROME CONDENSERS
Made of heavy gauge deoxidized seamless copper tube. One piece construction.
Designs for all requirements.
Rome-Turney Radiator Co.
ROME, N. Y.

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Distributors and Dealers

You need the PEERLESS line of compressors.

PEERLESS units give you a COMPLETE line, ranging from one to ten tons.

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A Quality Reputation on these products has been established through actual large quantity production on Cabinets widely distributed throughout the world. Another complete M & W Finish, including either Lacquer or Oil Primer, followed by M & W Lacquer Enamel in White or Colors.
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THE PUREST
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WE HAVE AN AGENT WITH OUR PRODUCT IN STOCK NEAR YOU — WIRE US WHERE WE CAN SERVE YOU
VIRGINIA SMELTING CO. West Norfolk Va.

LITERATURE OF MANUFACTURERS

Catalogues, bulletins and other material recently issued.

Manufacturers are requested to send copies of new trade literature to Electric Refrigeration News.

Arctic

Commercial refrigerators for the meat market, hotel, hospital or florist shop are illustrated in a folder put out by the Buyer's Door & Mfg. Co., Ltd., 374 Pacific Ave., Toronto, Ont., Canada. Three Arctic models are offered for use in meat markets. The model for hotels or hospitals can be had in five sizes. Florist refrigerators have glass fronts with two and three doors, respectively. A standard right-hand cold storage door is also illustrated.

Baldor

The Baldor Electric Co., St. Louis, Mo., in its bulletin No. 12, announces a new type CC capacitor motor designed for domestic application. This motor is of the single-phase type and is offered in ratings from 1/3 to 1.8 horsepower.

Copeland

Domestic and commercial refrigeration by Copeland are fully described in two pieces of literature prepared by the Copeland Sales Co., Mt. Clemens, Mich. New improvements, such as the Water Chiller, Coldial, Cold-hold, dessert trays, lighted interiors, bar type shelves, locked machine compartments, are discussed in the small booklet. Models in the De Luxe, A and P lines are illustrated. Commercial equipment in this piece includes three condensing units, zero tubes, Copeland-Larkin coils, water coolers, and Copeland-Spear ice water generators.

For the commercial prospect Copeland is showing eight condensing units, five of which are of the air-cooled type. This folder goes into detail in the description of Copeland-Larkin coils for commercial installation.

Ranco

New Ranco refrigerator controllers are announced in Bulletin 604 issued recently by the Automatic Reclosing Circuit Breaker Co., Columbus, Ohio. Two types, RA, adjustable, and R, non-adjustable, for temperature control in mechanical refrigerators are illustrated. This control can be attached to the ice tray sleeve, so as to be directly influenced by the contents of the ice tray, so that during freezing the control will keep the compressor running a greater part of the time, so as to produce quick freezing.

Superfex

The Perfection Stove Company, manufacturers of Superfex, the oil burning refrigerator, has just completed several attractive booklets and folders, covering the line for this year. One, a three-leaf flyer, describes two Superfex models with illustrations and specifications. A second, also of a size for inclosure mailing, illustrates and describes three refrigerators and the Superfex milk chiller. Both contain illustrations of the burner assembly and ice trays. These pieces are in three colors.

Another piece is a 5½ by 8 booklet of eight pages, in full color. Three refrigerators are illustrated and specifications included. The copy discusses refrigeration, food preservation and the special features of oil-burning operation at length.

Development of models operating without running water connections and others operating with or without circulating water has been followed by an extensive widening of the distribution organization for Superfex this year.

London Terrace Goes Electrolux

New York, N. Y.—One of the biggest domestic refrigerator sales on record goes to the credit of Electrolux Refrigerator Sales, Inc., which has received an order through the Consolidated Gas Company of New York for 960 Electrolux refrigerators, all of which are to go into London Terrace, the gigantic apartment group now being built in the Chelsea section by the Henry Mandel interests.

Big as this order is, it will by no means take care of the entire development. The 960 refrigerators will go into the ten buildings facing on 23rd and 24th Streets, which may be seen in the combination photograph and drawing which accompanies this article. These buildings will be finished first.

In the two large buildings at the ends of the group—facing on Ninth and Tenth Avenues—there will be 709 larger apartments than the 960 in the first group of buildings. In the entire development, which is one of the largest apartment house operations ever undertaken, there will be 1,669 apartments with a total of 3,796 rooms.

Elaborately arranged gardens have been planned by the Mandel organization for the interior section of the block. All of the twelve buildings will have an outlook over these gardens.

LITERATURE OF MANUFACTURERS

Catalogues, bulletins and other material recently issued.

Manufacturers are requested to send copies of new trade literature to Electric Refrigeration News.

Copper Bellows

Query No. 358—"Would you be good enough to give me the name of a firm manufacturing copper bellows for refrigerator regulating switches? These bellows are made somewhere in the East.

"I am familiar with the Fulton Company and also with Bishop & Babcock, of Cleveland, but I understand there is another manufacturer somewhere in the East that makes this same type of bellows."

Note.—The Clifford Manufacturing Co., 564 East First St., Boston, Mass., and the Bridgeport Brass Co., Bridgeport, Conn., manufacture copper bellows.

Refrigerants

Query No. 359—"Have you any data covering the amounts of refrigerants normally charged into compressors and coils? We would appreciate this information."

Compressors

Query No. 360—"We assemble our own refrigerating units and would like to have the names of concerns building compressors for household machine using sulphur dioxide."

POSITIONS WANTED

SALES Executive—Very broad experience national and foreign sales in electric refrigeration. Has large volume foreign business at hand and number of large distributors and dealers in the United States. Want connection with substantial manufacturer having well-built electric refrigeration units. Will take full responsibility for foreign or national sales, or both, on equitable commission or salary arrangement.

Response from chief executive invited, and will be held in confidence. Address Box 236.

ENGINEER, with executive ability, wants connection with manufacturer or large distributor. Five years' experience as service and commercial sales engineer, thoroughly familiar with all types mechanical refrigeration. Prefer western or foreign territory but will go anywhere if salary is attractive. Box 242.

THE vice-president and general manager of one of the largest electric refrigeration distributorships in the United States wishes to consider a new connection. Six years' experience in this industry as retail salesman, wholesale salesman, retail sales manager, factory representative, general sales manager and general manager. Thoroughly experienced in organization, sales, advertising, sales promotion, financing, and every function of a successful distributorship. Prefer middle-western connection. Address Box 241.

TWO positions wanted—One man with twenty years' and one with forty years, experience in designing, manufacturing and erecting ice and refrigerating machinery from ¼ to 300 tons' capacity and 100 to 2,000,000 cubic feet capacity. We are capable and practical engineers. Wish to give up manufacturing ourselves and make connections with some company which has ample manufacturing facilities. Believe we have many practical devices which can be annexed to your line. Box No. 249.

FIRST class sales manager. 37 years old; fifteen years' experience organization; excellent sales record on commercial and domestic electric refrigeration during last two years, wants connection with firm of good standing as European manager. First class references and full particulars on request. Write to B. N., 135 Rudolf Mosse, Barcelona, Apartado

REPRESENTATION or agency for the State of Michigan desired by former purchasing agent. Well known in the refrigeration and automotive industry. Part time or all time on any article or commodity of merit. Box 245.

REFRIGERATION Service Engineer. Eight years' experience in domestic and commercial refrigeration. Can organize and train service department in all types of installations. Prefer Copeland. Also well informed on oil and coal burning equipment. Box 238.

SMITH ADVANCED BY COPELAND

Mt. Clemens, Mich.—Carleton S. Smith, comptroller and assistant secretary-treasurer of Copeland Products, Inc., has been named secretary and treasurer by the board of directors, it is announced by President Louis Ruthenburg. He succeeds Edwin H. Brown, who, however, retains his vice-presidency and will continue to take an active part in the management of the company. Smith has been with Copeland since 1927. Previously, for five years, he was with the Chicago office of S. D. Leidesdorf & Co., certified public accountants, as supervisor.

WALKER RESIGNS FROM KELVINATOR

Detroit, Mich.—William B. Walker, Jr., has resigned as purchasing agent of the Kelvinator Corporation, where he has been for the last year. Before joining Kelvinator, Mr. Walker was connected with the Edward S. Budd Manufacturing Company.

G. E. MEN MEET AT KANSAS CITY

Kansas City, Mo.—Three hundred General Electric refrigerator dealers and salesmen met at a convention here March 6, at the Kansas City Athletic Club. P. B. Zimmerman, general sales manager, addressed the meeting through the photophone. New methods and products of the company were dramatized in playlets.

THE CONDENSER

ADVERTISING RATE fifty cents per line (this column only).

SPECIAL RATE if paid in advance — Positions Wanted — fifty words or less, one insertion $2.00, additional words four cents each. Three insertions $5.00, additional words ten cents each. All other classifications—fifty words or less, one insertion $3.00, additional words six cents each. Three insertions $8.00, additional words sixteen cents each.

POSITIONS AVAILABLE

SALESMAN on Kelvinator with complete knowledge of commercial line, able to handle domestic also. Salary and commission. Write fully. Kelvinator Miami, Inc. Miami, Florida.

WANTED experienced refrigerating sales engineers to sell Frick Ammonia and CO_2 refrigerating machinery from one-half to thirty tons; also the Absopure commercial line in Pittsburgh district. Must be capable of making estimates and specifications for dairies, ice cream plants, packing houses, markets, etc. In reply give experience, age, married or single. Good salary and commission to right man. Box No. 248.

LARGE distributing organization handling distribution in three states desires sales director thoroughly experienced in marketing electric refrigeration. Only men with proved capabilities and background of results will be considered for this unusual opportunity. Full qualifications and salary expected should be stated in first letter which will be held in strict confidence. Address Box 239.

DRAFTSMAN Wanted: Must also be good mechanic. For development work on new electric refrigerator. Small town with low living costs forty miles from Detroit. Salary $200 per month Give experience and phone number. Box No. 247.

MAN capable of setting up refrigeration distributorship and handling entire retail and wholesale organization now available. Best of references from present connection. Also capable of handling and developing territory for manufacturer of either household or commercial equipment. Address Box No. 250.

MISCELLANEOUS

FOR SALE—Large stock of Servel S7 refrigerators far below cost. Good opportunity for profit. All in original crates. Box 230.

FOR SALE—One of the best known store fixture plants in the East. Building complete line of fixtures, with or without electric refrigeration. Case specially adapted for quick freeze products. This is an old and reliable firm, building and equipping up-to-date fixtures for markets, dairies, drug stores, florists and restaurants. Selling on account of sickness. Full particulars on application. Box 244.

WANTED—For cash, standard makes of electric refrigeration units. Give full description and models and prices wanted. Box 243.

A LARGE manufacturer is considering the purchase of the manufacturing rights of a simple, inexpensive, reciprocating type electric refrigerating machine, and would like to contact with persons who have a machine that has actually been in operation and under test for at least a year. Address Box 240.

FOR SALE — Attention, Climax dealers. Three model F Climax compressors. One been repaired by factory, one new, one used four months. One new model D Climax compressor. Extra condenser for model F and extra condenser for model D. What are we offered for above described, F. O. B., Houston, Star Electric & Engineering Company, 1914 Main Street, Houston, Texas.

Wanted - A Man

for a Genuine Opportunity

A manufacturer of electric refrigeration for commercial use

whose product embodies exclusive features and advantages and has proved its exceptional sales possibilities

has an opening for a man to function in a sales-executive capacity;

a man who has had sound experience and is well grounded in merchandising of commercial electric refrigeration;

a man who is now employed but seeks an opportunity to make an outstanding success through unstinted application of his ability, with a worthy product and helpful co-operation.

If you are such a man, write now giving complete personal information, and details of your experience. Tell us everything we should know to determine whether an interview will be of mutual value. Enclose photograph if available. Your confidence will be respected.

Our own men know of this advertisement.

Address Manufacturer, Box No. 246
Electric Refrigeration News.

SUBSCRIPTION ORDER

ELECTRIC REFRIGERATION NEWS
550 MACCABEES BUILDING, DETROIT, MICH.

Please enter subscription to *Electric Refrigeration News.*

United States and Possessions: ☐ $2.00 per year. ☐ Three years for $5.00
All other countries: ☐ $2.25 per year. ☐ Two years for $4.00

I am enclosing payment in the form of ☐ Check ☐ P. O. Order ☐ Cash

Name .....

Address .....

City and State .....

Remarks: .....

REFRIGERATED FOOD

SECTION OF

ELECTRIC REFRIGERATION NEWS

VOL. 4, NO. 15, SERIAL NO. 91

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IN TWO PARTS, PART 2

THRESHOLD

Unlimited Possibilities Ahead in Markets of World

THERE are two compelling reasons why the advent of quick-frozen food has been hailed with such enthusiasm. Ordinarily, if a new process does one thing and does it well, it earns a substantial measure of popular approval, but when it has two outstanding and beneficial accomplishments to its credit, its popularity becomes tinged with excitement. That seems to be the case with quick-frozen food. It is capturing the public imagination with a speed that alarms many of the men who are backing it, and it is doing so because it not only offers a means of bringing foods to the table in better condition than in the past, but carries over into the meat, and certain other branches of the food industry, the guaranty of quality, safety and responsibility that is co-existent with packaged and branded foods.

Only time will tell which of these two reasons will prove more important in bringing about the public acceptance of quick-frozen food. Other minor reasons will bear some of the burden, but these two seemed destined to carry the major part of the load. Food that never has been allowed to grow stale because it has been frozen while it still retained the savor of freshness; food that is sold in identifiable packages, plainly marked as to quality, make an appeal to the public mind that puts the food industries on the threshold of a new era.

In many respects quick freezing is not new. Certain processes were patented in this country as far back as 1871, and since that date there have been a long line of patents covering various processes and machines for the quick freezing of food. Some investigations and experiments made in Germany in 1915 contributed much useful information in regard to the subject. Beginning about 1918, just after the war, the U. S. Bureau of Fisheries embarked on a series of experiments which included the quick freezing of fish. Since that time the Birdseye process, the Kolbe process, what is known as the Z process, the process developed by Dr. Harden F. Taylor, formerly with the Bureau of Fisheries but now with the Atlantic Coast Fisheries Company, and various air freezing processes have been developed, most of them in the United States. Various producers, such as the General Foods Corporation, the Atlantic Coast Fisheries Co., Swift & Co., and Wilson & Co. have had quick-frozen foods on the market for some time in different sections of the country.

Other producers, including Armour & Co., George A. Hormel & Co., Frigidized Foods, Inc., and others are known to be experimenting with quick freezing. In the normal course of events, it is reasonable to assume that some or all of them will put quick-frozen products on the market before many months have gone by.

To the fish industry, and especially to a peculiar phenomenon observed by Clarence Birdseye some years ago in Labrador, and by other fishermen in extremely cold climates, belong the credit for the present whirlpool of public interest that has centered itself around the subject of quick freezing. Fish caught through the ice when the temperature was far below the zero mark, froze almost instantly when tossed into the snow, and became hard as a board. Hours afterward, upon being thawed out, they came back to life. That extraordinary occurrence naturally led to the theory that if fish quickly frozen could later return to life, there must be no elemental disturbance of their flesh and tissues. And if true of fish, why not of meats and vegetables?

(Concluded on Page 8, Column 3)

Yellow?

IN journalism yellow is more than a color. It is a term of opprobrium, used to describe the publication that is a seeker after sensation. Why then should a trade newspaper like ELECTRIC REFRIGERATION NEWS print its new Refrigerated Food section on yellow paper? Has it decided to become a seeker of sensation?

The answer to the latter question is "Yes." The decision to print the new section on yellow stock was made for that very purpose. Readers who are interested in the particular sensation for which the NEWS is striving will find it in the last item in the last column on the last page.

BULLETIN

Springfield, Mass., March 25—Sales of quick-frozen foods are showing accelerated gains as campaign enters fourth week. A new high record was made Saturday, March 22, at the 10 stores handling the Birdseye lines. Orders for a 79-cent combination on lamb chops and peas came so fast at one store that it was necessary to renew the stock twice. Thrift Store at Winchester Square reported big sales. Rood & Woodbury market had a particularly heavy run on roasts. Trucks were kept busy in the afternoon renewing supplies from the Atlantic State Cold Storage Warehouse to the stores. As a special encouragement beef rib roasts and pot roasts sold for 38 cent a pound, against 45 cents regularly, and lamb roasts for 32 cents, against usual price 36 cents. Store heads are manifestly pleased at the results.

Buying Power

The American Housewife Must Be Satisfied with the New Frozen Products

TRANSPORTATION

Pears Cross the Continent

New York, N. Y.—Results of a valuable test in the field of refrigeration have been announced by Safety Refrigeration, Inc., makers of steel iceless refrigerator and heater cars. One of the new cars was loaded in Yakima, Washington, with 756 boxes of pears, which previously had been kept in cold storage. They were placed in the car at a temperature of 31 deg. F. and the controls were set to maintain a temperature of 32 deg. throughout the trip.

The outside temperature en route ranged from about 50 deg. during the first part of the journey to about 60 deg. after the car had been on its way a few days. The shipment arrived in Jersey City on a Sunday morning, but was not unloaded and placed on the auction until Wednesday morning. An average temperature of 32 deg. was maintained in both the fruit and the car from the time the shipment was loaded in Yakima until it was unloaded thirteen days later, including the two days it was held on track in Jersey City yards.

Both the heating and refrigerating apparatus operated automatically en route, supplying either refrigeration or

(Concluded on Page 4, Column 1)

ZAROTSCHENZEFF

London, England.—M. T. Zarotschenzeff, who developed the method of quick freezing of meats, fish, fruits, etc., in atomized brine, has moved from Paris to here.

The S. C. Bloom & Co. is using the "Z" method in this country and Canada. In England and other countries the Liverpool Refrigeration Co., Ltd., will use this process, and Mr. Zarotschenzeff will join this company in the near future.

CASEMAKERS

Anticipate Need for Equipment

WHAT has the refrigeration industry been doing to meet the demand for display and storage cases that will handle quick-frozen food properly? How many manufacturers now have cabinets that will take care of the job? What are the problems that must be solved in designing and building suitable cases?

Those are a few of the many questions that are being asked daily as the quick-frozen food movement gathers momentum. Some of them are being answered with confidence, some hesitatingly, but so far as the refrigeration industry is concerned, there can no longer be any doubt of the fact that it is keenly alive to the situation and to its great opportunity.

So far as the willingness to turn out cases that will do the work extends,

(Concluded on Page 4, Column 4)

SPRINGFIELD

Continues to Buy Birdseye Foods as Campaign Goes Forward

Springfield, Mass.—Satisfaction with the way in which quick-frozen foods were selling in the early stages of the test sales campaign was expressed by the General Foods Corporation in a statement issued at the close of the twelfth selling day. Since that time, nothing has occurred which would indicate any material change. The statement said that initial public acceptance was much more gratifying than had been anticipated, and sales resistance less pronounced than expected by the most optimistic General Foods executive. It further reports that more than 1,000 customers have bought Birdseye Frosted Foods on favorable shopping days. The statement ends as follows:

"Although customers have their choice of 21 cuts of meat, clerks report requests for meat products other than those being sold. Customers are asking also for other kinds of Birdseye frosted vegetables, fruits and sea foods, and are asking when additional products will be available.

"Important grocery stores in nearby towns, in response to suggestions of customers who have been buying Birdseye products in Springfield, have asked for low-temperature display cases and stocks of the new products.

"Sales on grocery items in several of the ten stores have reached record-breaking proportions, which the store managers attribute directly to the installations of Birdseye products."

Thus far the campaign has made steady progress and gives every evidence of skillful management. Now and then some minor criticisms crop out, such as a rumor that has been making the rounds to the effect that the peas do not measure up to the standard of the other frozen foods.

The publicity campaign has been well handled to arouse and increase consumer interest. First came a series of full-page and smaller newspaper advertisements, along with news articles that gave detailed information about the new departure. Then, a few days after the quick-frozen foods went on sale in the stores, the Home Progress and Electrical Exposition opened in the Municipal Auditorium for a full week, and lectures and demonstrations of the cooking of these foods by electricity were made a star feature. In this campaign the local electric appliance dealers united with electric light and power concern and the the General Foods Corporation to put the message across effectively.

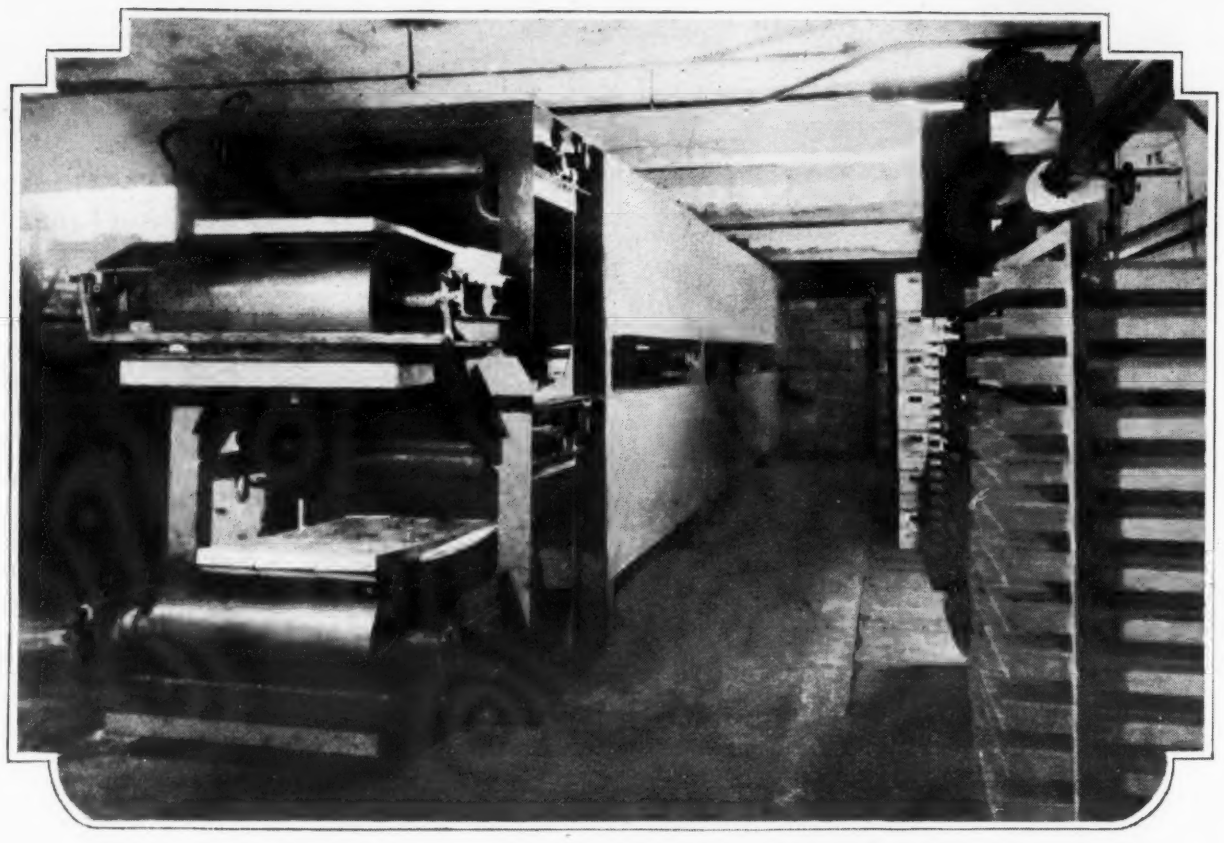
Immediately following this exposition, which drew big crowds from the city and the surrounding shopping area, the Springfield Gas Light Company and the large department store of Meekins, Packard & Wheat joined with the General Foods Corporation in a demonstration of the cooking of quick-frozen foods by gas. A lecture room seating 150 persons was fitted up in the department store, and the frozen products were exhibited under glass in a cabinet, similar to those used for these foods in the retail stores. Demonstrations were given daily from 2 to 4 in the afternoon, the foods being cooked in front of the audience and samples passed out to the spectators.

At a typical demonstration at this store a leg of lamb was roasted, sirloin steaks broiled, a casserole dish consisting of sausaage and macaroni, with chopped green peppers and other seasoning, prepared; then a vegetable was cooked, such as peas or spinach, and finally a treat of cherry pies was cooked and given out. During these demonstration periods the seats have generally been filled, and with many passing in

(Concluded on Page 6, Column 1)

Quick Frozen Foods Have Added Appeal Because They Are Presented in Packages

Where the Fillets are Frozen in Gloucester Plant of General Seafoods



The packaged fillets of fish are passed between metal plates during the quick-freezing process

NOW! a NEW "DRY-KOLD" for Quick Frozen Foods

THE "DRY-KOLD" Display Counter for *Quick Frozen Foods.* Sub-freezing temperature *always* in every cubic inch of display space above and storage space below. Walls are 6-inches thick — 4-inches of corkboard insulation. Porcelain finish. Four courses of plate glass. Trimmed in Monel Metal. Electric illumination.

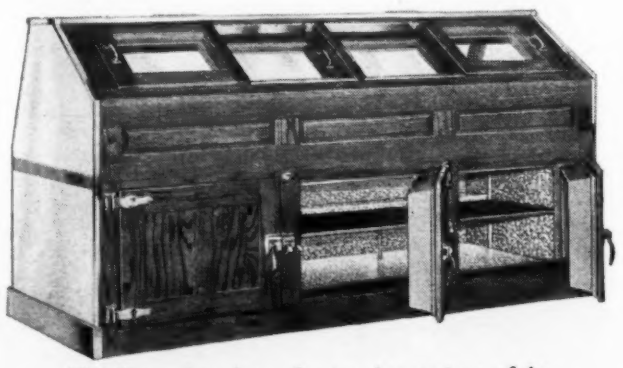
An Achievement for the Industry

Months of planning, experimenting and testing precede this announcement. The refrigeration needs of quick frozen foods are not a new or vague subject to "DRY-KOLD" engineers. Their work has developed hand in hand with this new industry itself. Just as frozen food packers now have a thorough knowledge of *their* processes—so have "DRY-KOLD" engineers mastered the scientific processes of continuous sub-freezing refrigeration.

This new Display Counter for frozen foods completes the cycle of units needed for the successful distribution of quick frozen products. More than that, it makes possible the successful merchandising and display of these foods — before the eyes of the ultimate consumer.

Write for Complete Information

Whether you are a retailer, manufacturer of quick frozen foods or a distributor of refrigerating equipment, you should prove to your own satisfaction that these strong claims are true. Write immediately for complete information. Let us prove to you that the new "DRY-KOLD" opens a rich avenue to better merchandising, bigger sales and increased profits. In fact, familiarize yourself with the entire "DRY-KOLD" line—a better refrigerator for every commercial need. Simply clip and mail the coupon below for the new 1930 "DRY-KOLD" Catalog—and complete details regarding the new *Quick Frozen Foods* "DRY-KOLD."



The illustration shows front and rear views of the new "DRY-KOLD" for Quick Frozen Foods. Note attractive display and ample storage space.

The "Dry-Kold" Refrigerator Co., Niles, Michigan

Gentlemen: Please send me immediately complete details regarding the new "DRY-KOLD" for Quick Frozen Foods — and your 1930 "DRY-KOLD" Catalog.

*Name*_____

*Firm*_____

*Address*_____

*Town*_____ *State*_____

Pin to your letterhead, if you choose.

PIONEER

Clarence Birdseye Tells of Problems Which Confront New Industry

INTEREST in the preparation and distribution of quick-frozen packaged perishable foods has become widespread during the past year. Perhaps the following account of some of our experiences may prove of value in working out the large number of problems which yet remain to be solved before this new industry may be established on a firm commercial basis. There is nothing mysterious about this business, but there are a number of basic considerations which must constantly be borne in mind by those who are responsible for developing and placing on the market additional quick-frozen products.

Quick freezing is especially valuable as applied to various flesh products—such as meats, poultry, and seafoods—and the following statements refer to such products rather than to fruits and vegetables. The principles underlying quick freezing are now so generally understood that it is not necessary to discuss that matter here further than perhaps to state that it is impossible to draw any sharp line between slow-frozen and quick-frozen products and to point out that a freezing process which is sufficiently rapid to constitute quick freezing with one product may produce only slow freezing when applied to some other substance.

It is essential, however, that we have a definition of the term quick freezing, and since as far as my experience goes, there is no substitute for microscopical crystals, I venture to define quick freezing as freezing in a sufficiently short time so that crystals which are formed within the tissues of the product are so microscopical that they cause no appreciable damage. A quick-frozen flesh product when thawed must so nearly resemble the product before it was frozen that the most critical practical observer, such as the dealer, the cook, or the consumer shall be unable to notice any difference in its appearance and flavor. Quick-frozen meats must retain their natural bloom and the leakage must not be substantially greater than that of the unfrozen product.

That quick-frozen flesh products are to all intents and purposes undamaged was amply demonstrated by the experiments carried on in the Gloucester plant of the General Seafoods Corporation fourteen months ago by an especially appointed committee of the Institute of American Meat Packers. After exhaustive tests the committee found that the quick-frozen product was unchanged in appearance, drip, and flavor.

Storage Problems

Quick-freezing will not, however, insure the delivery of high grade products to the consumer. A perfectly frozen product may be seriously damaged while held in cold storage. Let us, therefore, consider briefly what causes are responsible for deterioration in storage and how the damage may be guarded against. The first, and perhaps most obvious source of trouble, is desiccation, or, as the packers call it, freezer burn. This drying-out of the product in storage is due to the transfer of moisture-vapor from the product to the pipes or other refrigerating medium. The second cause of damage during storage is oxidation or rancidity of the fats. The third cause of damage is the building up of large ice crystals in products which contained only minute crystals when placed in storage.

Desiccation during both freezing and storage may be prevented if a substantially moisture-vapor-proof wrap or other protection is placed in intimate contact with the exterior surfaces of the product. Oxidation is caused almost entirely by contact of the product with the oxygen in the air of the storage room. Obviously, if the product is substantially hermetically sealed against contact with the air, oxidation will be greatly lessened. Moreover, oxidation takes place much more slowly at low storage temperatures; and it has been our experience that rooms in which fatty products are stored should be held at not higher than zero degrees Fahrenheit.

In properly storing frozen products, the size of the ice crystals does not increase during storage if they are kept at an even low temperature. If, however, the product is allowed to become partially thawed and then later refrozen, the increase in the size of the crystals may seriously damage the product.

Clarence Birdseye

The Ideal Package

Quick-frozen products which are to be held for a considerable period in storage must, then, be afforded the maximum protection against desiccation, oxidation, and temperature changes. Our experiences have led us to adopt as more or less ideal for the purpose, a rectangular moisture-proof Cellophane lined or wrapped cardboard carton. Under certain circumstances, the moisture-proof Cellophane may well be replaced by waxed vegetable parchment paper or waxed glassine paper. In any event, the package should be rectangular and substantially moisture-vapor-proof and air-tight. A paper carton is reasonably inexpensive, is thoroughly practical, and may be made very attractive in appearance.

Packages of quick-frozen products must be compactly filled, having a minimum of included air spaces. This compact packaging is essential if oxidation and desiccation are to be minimized. It is also obvious that a compactly filled package will be very much cheaper per pound of contents than one which contains numerous unfilled voids. The package should be relatively thin to insure rapid freezing and rectangular to allow compact packing of the individual unit packages in shipping containers, storage rooms, and refrigerated cars.

We believe that products should be

(Concluded on Page 9, Column 1)

For Quick Frozen Foods

unfailing Refrigeration is a Necessity!

So unfailingly dependable are General Electric Refrigerators, that of the hundreds of thousands of owners,

not one

has paid a cent for service!

Three popular styles of General Electric Commercial Refrigerators—showing the ready accessibility of foods—the abundant storage space provided—and the variety of uses to which all models may be put. In the left and center models, fresh meats and delicatessen items are stored, while the right-hand model is devoted to quick-chilled meats furnished by Swift & Co.

Many stores are finding the products of the Atlantic Coast Fisheries a most profitable line for increasing their daily income. General Electric Commercial Refrigerators keep these excellent products *unfailingly* in the very finest condition.

SUNKIST FOOD STORES
NEW LONDON, CONN.

Even the smallest General Electric Commercial Refrigerators are large enough to easily accommodate over 100 lbs. of meat.

GENERAL ELECTRIC
COMMERCIAL REFRIGERATOR

ELECTRIC REFRIGERATION DEPARTMENT GENERAL ELECTRIC COMPANY HANNA BUILDING, CLEVELAND, OHIO

Iceless Refrigerator Car Finishes Coast to Coast Run

(Concluded from Page 1, Column 2)
heat as required to hold the temperature evenly at 32 deg.

Three very interesting facts regarding this shipment follow:

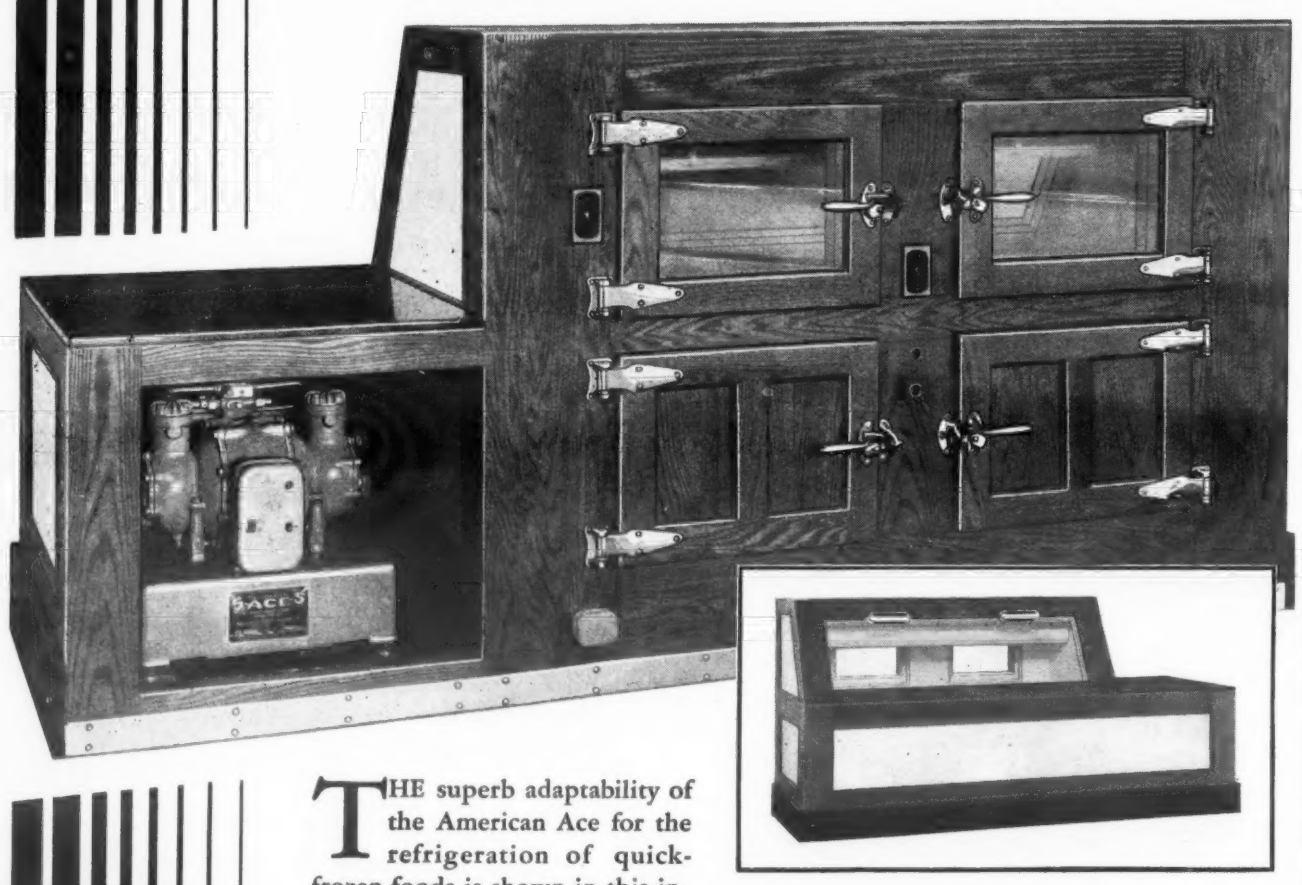
First: A uniform temperature of substantially 32 deg. was maintained throughout the entire trip.

Second: The safety iceless car carried 48 per cent over the ice-bunker type car. refrigerated 756 boxes of pears, by reason of its overhead method of refrigeration, as against 511 boxes which is the average load carried in the ice-bunker refrigerator, the height of the load in the ice-bunker car being limited by reason of end ice-box method of refrigeration. The loading in the safety car, therefore, was increased 245 boxes.

Third: The fruit which arrived in the safety iceless car, when placed on the auction brought 40 cents to 45 cents per box more than fruit received from the same district in other refrigerators of the ice-bunker type. This amounted to more than $300 on the carload.

The test was made under the direction of the United States Department of Agriculture, and was in charge of E. D. Mallison, marketing specialist of the Bureau of Plant Industry, and C. L. Powell, junior physiologist of the United States Department of Agriculture, who took temperature readings several times daily. The shipment was also accompanied by C. W. Kohagen, traffic manager of the Yakima Fruit Growers' Association, and Ralph Killingstad, representing Safety Refrigeration, Inc.

The AMERICAN ACE ··· for quick frozen foods ····



THE superb adaptability of the American Ace for the refrigeration of quick-frozen foods is shown in this integral installation of the machine with its especially built low-temperature case.

The machine is fully enclosed and hermetically sealed; entirely automatic, and compact — occupying about half the space of other machines of similar capacity. Efficient, economical and thoroughly dependable, the American Ace is covered by two-year guarantee. It has no belts, stuffing boxes, idlers or seals to cause annoying and costly service.

The case is staunchly built with four-inch walls, heavily insulated with corkboard — three courses of plate glass. There is a generous storage compartment beneath the display, cooled by separate coils. Shipped complete with machine as a unit. No installation required — simply plug it in.

A Profit Opportunity for Dealers. Write now for complete facts. Your territory may be available. No obligation, of course.

Refrigeration Division THE AMERICAN FOUNDRY EQUIPMENT CO., Mishawaka, Indiana

American Ace Automatic Refrigeration

CASEMAKERS

(Concluded from Page 1, Column 4)
there is a unanimity of expression, but that is as far as it goes. There is little agreement on the temperatures necessary for keeping the frozen food properly; there is divergence on methods of defrosting; on air circulation; fogging of glass; position of doors, and a host of other points.

As a matter of fact, the whole question is too new to permit of a decisive answer to any of these questions. Quick-frozen foods have not yet been on the market long enough to test thoroughly the cases from which they have been sold. The General Food officials in charge of the Springfield tests are watching the performance of the display cases as carefully as any other detail. And Clarence Birdseye says on another page that, in his opinion, the case problem has yet to be solved.

What are some of the ramifications of the case problem? First of all, perhaps, is the necessity for much stronger construction than is needed for cases maintaining higher temperatures. Authorities differ on the temperatures which must be maintained if quick-frozen foods are to be kept properly; some want the retailer to keep the storage section of his case at a temperature ranging from 5 to 10 deg. F.; others regard that as unnecessarily low. But they all agree that a case designed for considerably higher temperatures is not likely to be staunch enough to stand the strain of the lower ranges. They fear that moisture will find its way into the joints, or other equally calamitous events will break them down.

Then comes the defrosting. How is it to be done without raising the temperature of the case to a point where the quick-frozen food within would be endangered? Various methods are proposed, and the makers of some cases remark that they have eliminated the defrosting problem by so arranging their coils that no frost can form. Blowing hot gas through the coils is one method that several manufacturers have adopted. Other methods are finding favor. The defrosting problem still seems to present an open question that only time will solve to the satisfaction of the industry.

Proper placing of the controls raises another question. Shall the display part of the case be the kingpin or shall the guiding hand be trusted to the storage section? Or shall there be separate controls? While pondering on this point, it might be well to remember that the sudden placing of a large mass of frozen products all at a temperature of 5 deg. F. or thereabouts, is bound to have some effect upon the temperature of the storage compartment, while it may have little or no effect upon the display section.

Visibility for the frozen products creates its own problems. Proper lighting must be devised. The glass front of the case must be sufficiently insulated. Some casemakers use three panes of heavy glass; others insist that four is the correct number. Still others say even less are required.

The fogging of the glass is another phase of the visibility problem. Can it be eliminated without a great deal of care and trouble? The manufacturers are divided on that point, too. Some dismiss it as of no great importance; others explain carefully the precautions that they have taken to prevent this condition.

Arrangement of doors, so that salesmen can get at the frozen products with a minimum of difficulty, also is absorbing the attention of the designers of cases. It seems to be the accepted theory that so far as possible sales must be made from the storage section rather than from the display compartment, although at the same time it would be unwise to refuse to sell directly from the display. That situation creates its designing problems. Must the salesman duck out of sight and stoop way over nearly to the floor when he gets out a packaged leg of lamb, or shall he be allowed to earn his living while standing upright? How can he get at packages at the front of the case, and how can he replenish his stock most conveniently? Those are questions that the designers are still working on. Some of them think that they have the answers, and perhaps they have, but it is in the severe school of the next year's experience that they must prove that they are right.

All this seeming chaos, all this division of opinion among the manufacturers of display and storage cases, may look, at first blush, as though the refrigeration industry does not quite know what it is all about. That is not the case. Only a progressive industry, an industry that is willing to anticipate a need, and to risk time and labor and money in getting ready before the actual need arrives, would work as the refrigeration industry has worked to prepare for the coming of quick-frozen foods.

The problems are many, and most of them must await the test of time.

PACKAGING

PROPER packaging of quick-frozen foods is an important factor in their appeal to the public. Much of the Frosted Food now on sale in Springfield, Mass., was wrapped by machines made in that city by the Package Machinery Company, which numbers the General Foods Corporation among its customers.

Alden French, of the Package Machinery Company, makes the following statement in regard to his organization's activities thus far in the development of quick-frozen food:

"As leading manufacturers of automatic wrapping machines, the frozen food people have turned to us for assistance in their packing, and we have built a number of machines for wrapping cartons containing such products as frozen fish, berries, etc.

"Wax paper as a wrapper has long been familiar to us, and some of the frozen goods now in the market are enclosed in this material. Recently, however, cellophane has become very popular and the demand for this material seems to be growing rapidly. Our research department has made extensive experiments in the handling of cellophane, and we feel that we are well fitted to supply machines to wrap and seal, not only plain, but moisture-proof cellophane, as well.

"We are working closely with the frozen food people to help them improve their packages and make them more saleable. As yet this business is fairly new and consequently not a great deal of automatic wrapping machinery has been installed for this purpose, but we feel very strongly that we are fitted to furnish machines that are suitable for these products. Our machines are fast, of splendid construction, dependable and efficient.

"Our Model F-5 machine is the one being used by General Foods for the wrapping of their cartons of frozen fillets and frozen berries. This machine can be equipped either for wax paper or for cellophane. This machine is not an experiment. It is a model of which we have built a great many hundred and which is in very wide use among the manufacturers of biscuits, macaroni, tea, cigarettes, etc. Besides this machine, we build a great many other models designed to handle packages of various shapes and to perform different styles of wrapping."

Marsden

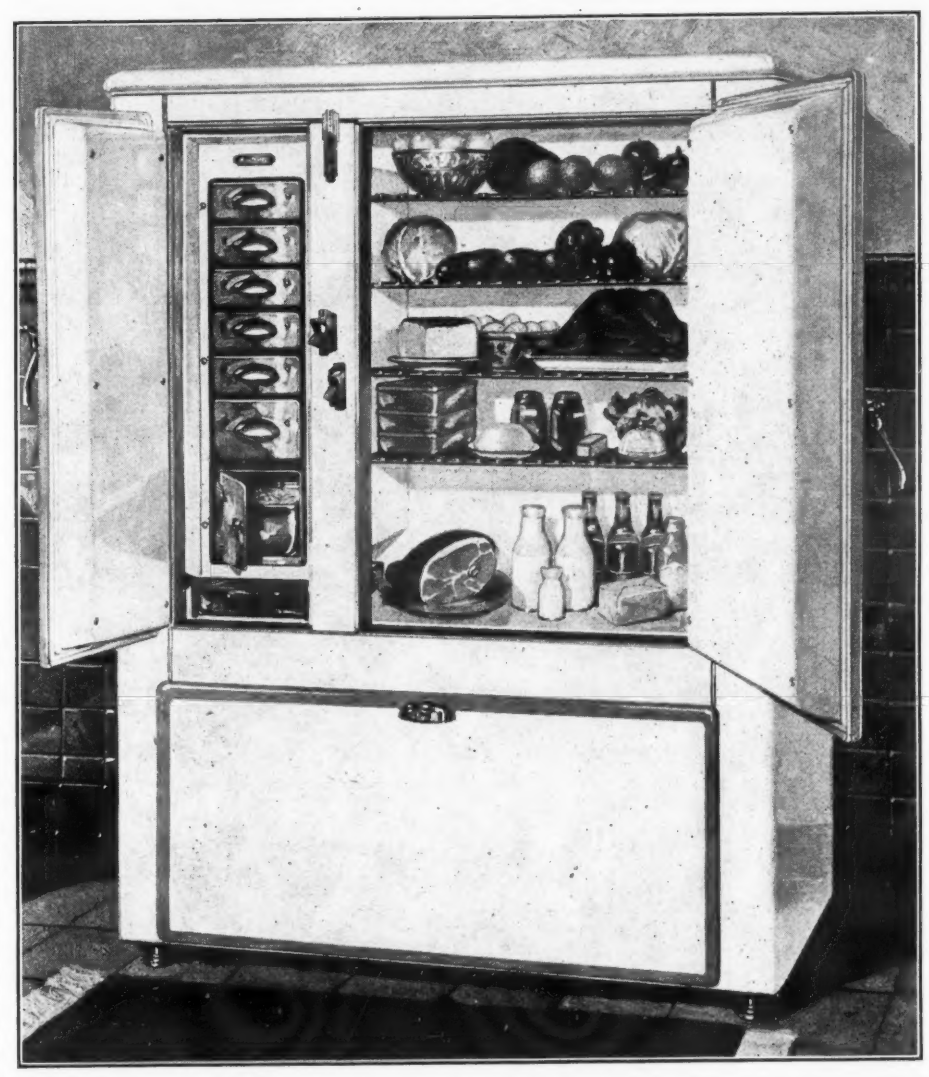
DISPLAY and storage cases, which can be used for handling quick-frozen food, are being manufactured and marketed by Marsden's, Inc., of East Providence, Rhode Island. The Marsden organization is one of a number of eastern manufacturers, who have anticipated the popularity of quick-frozen products by building display cases for them.

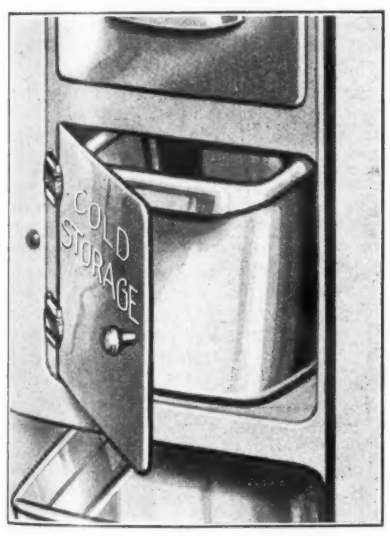
Low Temperature Display Cases by Puffer - Hubbard Mfg. Co.
MINNEAPOLIS, MINN.

Gibson
Custom Built DISPLAY CASES and REFRIGERATORS for Quick Frozen Foods
MAXIMUM DISPLAY
POSITIVE PRESERVATION
Gibson Refrigerator Co.
Commercial Dept., Greenville, Michigan

The Cold Storage Compartment *is EXCLUSIVE to* KELVINATOR

Kelvinator alone provides facilities for handling FROZEN FOODS *in the home*





Cold Storage Compartment Temperature Below 32 Degrees

Directly below the lowest ice cube tray in De Luxe Model Kelvinators, is the new Cold Storage Compartment. Here, behind a neat metal door, a world of new convenience is ready for users. Always below freezing, this compartment keeps meat, fish, game and frozen delicacies in finest condition. When desired, it may be used for storing an extra supply of ice cubes.

THE era of frozen foods is here—*today*—and the coming months will unquestionably witness the sale of frozen foods at every corner store. With the widespread distribution and sale of these products, electric refrigeration buyers will *demand* facilities for proper storage of frozen foods in the home.

Kelvinator, having pioneered the major advancements in electric refrigeration for the past 16 years, again gives evidence of its outstanding leadership—for Kelvinator alone has the Cold Storage Compartment, operating at below freezing temperature, for the safe-keeping of frozen foods in the home.

Further evidence of Kelvinator's leadership is demonstrated by Kelvinator's *wholly automatic operation.*

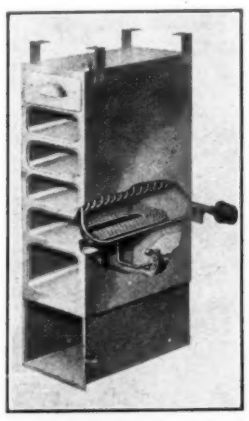
1. Fast freezing for an abundance of ice. 2. Special super-fast freezing. 3. Cold storage. 4. Forty to fifty degree cold for foods—all of these functions entirely automatic.

. . . . plus the proved reliability of the rugged, *quiet* Kelvinator mechanical unit—gleaming white all-porcelain-lined cabinets—massive, *moderne* hardware—electrically lighted cabinets in the Deluxe line—rubber ice trays—and a price range that matches every family budget.

These sales features, by reason of their direct appeal to the buyer, on the basis of convenience, dependability, wholly automatic and all inclusive refrigeration—are winning thousands of Kelvinator prospects against all competition.

•

The Kelvinator franchise was never more valuable than now. Full details on the Super-Automatic Kelvinators, in three price ranges, will be gladly sent to interested dealers.



Automatic Fast Freezing With Iso-Thermic Tubes

The fastest freezing ever known, secured *automatically.* No manual control is needed. Nothing to manipulate or get out of order. When you slip a tray of water or dessert into the Iso-Thermic sleeve, the contact of warm tray starts the unit. When the tray is frozen, the unit stops. No wasted operating costs, no wasted food, but quick freezing at all times, *without attention.*

KELVINATOR SALES CORPORATION, DETROIT, MICH.

KELVINATOR OF CANADA, LIMITED, LONDON, ONTARIO KELVINATOR LIMITED, LONDON, ENGLAND

SPRINGFIELD

(*Continued from Page 1, Column 5*)

and out, the number getting the benefit of these demonstrations came to several hundred daily. A fire of questions during and following the demonstrations gave evidence of the interest awakened. Errors on the part of housewives in carrying out instructions cropped up every now and then, and consumers thus were put on the right track.

On these occasions, as well as at the stores where the quick-frozen foods are on sale, the expressions from persons who have tried them have been almost uniformly in the nature of praise, and exceptions to this rule have been traced for the most part to failure on the part part of the consumer or store employees to follow the course of procedure laid down by the General Foods Corporation.

Soon after the frozen foods went on sale here, Ray Lyman Wilbur, Secretary of the Interior, sent his executive secretary, Ernest W. Sawyer, to Springfield, to investigate the working of the Birdseye system. He was accompanied by F. S. Snyder, chairman of the Institute of American Meat Packers, and Alfred H. Benjamin, president of the New Zealand Meat Producers' Board. The particular purpose of Mr. Sawyer's visit was to get light on possible aid in marketing the large supply of reindeer meat and wild berries available in Alaska. There are more than a million reindeer in Alaska, Mr. Sawyer said, and as the females are protected, their number is increasing rapidly, so that it is estimated that as many as 300,000 will be bred annually and carcasses shipped out at the rate of approximately 1,000 a day, if satisfactory refrigeration conditions can be provided. The quantity of marketable wild berries to be had in Alaska is enormous, he added.

An outstanding point revealed in this campaign, according to merchants and other close observers, is that while the success of the quick-freezing system appears to be completely established from a production standpoint, considerable remains to be done to bring the merchandising of such products up to the same level of efficiency. Suitable cabinets for use in retailing these foods have not as yet been provided, it is said.

Those closest to the work feel that in order to make the retail handling of quick-frozen foods satisfactory and economical, the cabinets should be of larger storage capacity and built with a special view of the handling of such packaged goods, and also should enable the foods to be stored at a requisite low temperature while operating the refrigeration apparatus at less frequent intervals. By keeping more stocks on hand the retailer would avoid frequent calls for deliveries from the warehouses, which hand-to-mouth method necessarily adds to the overhead expense.

Counter men find themselves somewhat hampered by the limited size of the storage compartments of the cabinets, making it difficult to serve customers promptly and keep the goods in first-class order. The need of keeping the many items of foods in separate piles, so that any item can be had without an instant's delay, without removing any other item from the case or shuffling the contents, and also of having the inside of the storage case equipped with lighting arrangements, are points which create problems.

It is recognized, however, that such considerations are secondary to the factors of efficiency in the production of the foods and the high degree of consumer interest that unquestionally has developed in the short time that the campaign has been in progress. It is recognized that the machinery of distribution and merchandising is as yet imperfect, and that, as in every new departure of a revolutionary character, some time is required to obtain uniformly satisfactory results.

Clarence Birdseye, inventor of the Birdseye quick-freezing process, arrived in Springfield Thursday morning and went directly to the offices of the General Foods Corporation. Mr. Birdseye was joined by Dr. Ludwig Roselius, of Berlin, Germany, food scientist and inventor, and Richard Hellman, of New York, of the Hellman Food Products. These men, with F. S. Snyder, of the Institute of American Meat Packers; Gardner Poole, of Boston, refrigeration engineer; Marion Harper, vice-president of the General Food Sales Company, and L. H. Sherrill, advertising manager of the Frosted Foods Company, were hosts to a group of refrigeration engineers of the Frigidaire Corporation at a luncheon in Hotel Stonehaven. After the luncheon the party made a tour of inspection of several of the stores where the quick-frozen foods are being sold.

Dr. Roselius declared that the quick-freezing process should be particularly desirable in Europe, because fruits and vegetables are not now available to the masses in quantities, except for short seasonal periods. The new process, he believes, will bring perishable foods within the reach of millions. Contrary to the general belief, he declared, no great amount of meat is being imported into Germany from the Argentine.

Mr. Birdseye left Springfield Thursday night. Before departing he expressed his pleasure at the success attained thus far in the Springfield campaign.

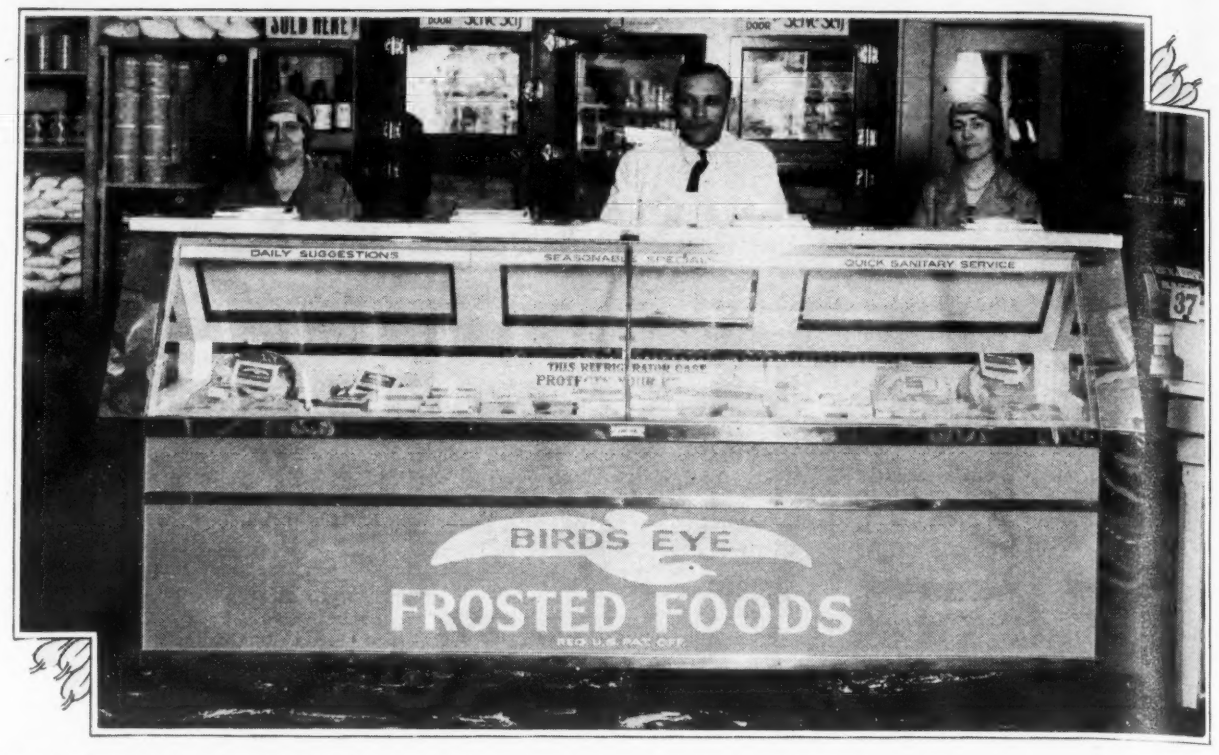
Among the Frigidaire representatives was B. J. Vandoren, of the Frigidaire Corporation. He said that his company is prepared to build refrigerating equipment adapted to the merchandising of quick-frozen foods, and has developed refrigerated display cases that in actual tests have held foods in a perfect state of preservation for 100 days. He added that this line of retailing calls for heavy duty refrigerating equipment similar to that used in electrically refrigerated ice cream cabinets.

Demonstrations at the Meekins, Packard & Wheat store had the effect of increasing new sales. Although none of the foods was sold on the premises, the publicity was a means of sending more people to the depots established for such sales, and the regular patrons of these stores were augmented by a larger number of strangers drawn in by the special attraction. In the week that followed the opening of the drive it seemed to clerks and demonstrators that a very large percentage of the buyers of these foods were "repeaters." This was gratifying evidence of the approval accorded the foods on first experience, but a constant influx of new customers also was an objective. This end is being furthered as the foods are more widely talked about and their praises are circulated from one family to another.

Beginning March 20, a series of lectures and demonstrations was started at the Springfield Women's Club, through the co-operation of the United Electric Light Company. These are being given three afternoons a week, with a motion picture as a feature. Tickets were sent out to persons who, it was thought, would be especially interested. The first meeting proved disappointing in attendance, possibly because those invited knew that they had more than one opportunity to attend. It is likely that invitations will be extended to members of other women's clubs of the city.

The Frosted Foods Booth at the Springfield Home Progress and Electrical Exposition.

Selling Birdseye Products from Oreole Case



The offices of the General Foods Corporation in the State Building in Springfield have been among the busiest in the city. Inquiries have come in from all quarters, and visitors from many distant points have called to seek information and get samples of the foods to take away. This privilege has been accorded to persons living as far away as Chicago. Put up in insulated boxes, the contents were transported in good order by persons traveling by train or motor.

Newspaper advertising is being continued and issues of Friday evening and Saturday morning, March 21 and 22, carried broadsides calling attention to leading food items and featuring a special combination of a pound of lamb chops and a package of fancy Oregon peas for 79 cents.

A significant thing about this drive has been the many comments received on the high quality of the fish. Here in Massachusetts, where fresh-caught salt-water fish can be brought to the retail markets within a few hours, it might be thought that no special call would be voiced for a special device to deliver fish in a better state. The popularity of the quick-frozen fish is one of the strongest evidences of the merit of such a process, in the view of observers. The quick-frozen oysters also have made a decided hit.

So far as meats are concerned, medium-priced steaks and moderate-sized roasts have been generally the most popular with the average customer. The roasts have been a big Saturday item. Porterhouse steaks naturally have moved in much less volume, this depending largely on the neighborhood surrounding a particular store. Customers in the habit of purchasing high-priced meats have shown a readiness to try out the new line.

Besides the Frigidaire and Kelvinator units mentioned in the March 12 issue of ELECTRIC REFRIGERATION NEWS, in connection with the opening of the Springfield drive, other Kelvinator units since have been installed. There are now five Kelvinators in use, including those at Meekins, Packard & Wheat's and the Women's Club. Leading refrigerator companies, through their Springfield agencies, manifest an interest in the progress of the local test, and the agents themselves are giving close attention to it, realizing its potential importance.

The Highland Hotel, in Springfield, is the first hotel in the United States to serve foods quick-frozen by the Birdseye process to its guests. The first dinner with these foods on the menu was served for the Springfield Advertising Club, whose members were strong in their praises of the viands. Since then the service has been extended to a number of private parties in the hotel, with uniformly good results.

This innovation will continue and it is planned to do more with the advent of warm weather, R. G. Jahrling, proprietor of the Highland, says. No plans have been formulated as yet to extend the serving of the quick-frozen foods to regular dining-room patrons. For the present it will be confined to special parties. Later on, it is believed, the experiment may be made at regular hotel meals, and when this is done it will be well advertised in advance.

Meanwhile, the Highland has the status of an experiment station in this connection. Mr. Jahrling personally visited the Batchelder-Snyder plant in Boston and saw the foods prepared for the market.

"We are going to give the products a thorough try-out," he told an ELECTRIC REFRIGERATION NEWS representative. "If the plan works here it will work in other hotels."

CONVENTIONAL CASES INADEQUATE

By B. J. Vandoren
Frigidaire Corporation

AFTER extensive research and experimental work in its engineering department and bacteriological laboratory, supplemented with some very interesting field tests in connection with the retailing of Birdseye Frosted Foods by the General Foods Corporation in Springfield, Mass., Frigidaire Corporation is now prepared to build refrigerating equipment that will hold such foods in proper condition. At the same time it is prepared to furnish such mechanical equipment to manufacturers of display cases and storage boxes who are seeking to meet the demands of the new industry.

A great many opinions and theories formulated during the initial experimental work had to be revised as a result of data built up by the bacteriological laboratory, and these resultant ideas, which worked out very well in the testing department, had to be still further revised after experimental equipment was tried out in Springfield.

Engineers of the organization, who have been watching developments of the new frozen foods industry for many months, began their work on the premise that refrigerating equipment necessary for the needs of the new industry would have to provide much lower temperature than those necessary to meet the needs of the retailer of fresh perishable products.

As a matter of fact, it was evident that the temperatures required would have to be so low that display cases, storage boxes and cooling equipment built along conventional lines would be absolutely inadequate to meet the requirements of the frozen foods industry.

The refrigeration industry consequently found itself in a position where too much haste would mean a lot of waste later on, if it undertook the installation of refrigerating machinery in display cases and storage boxes that were not designed primarily for handling frozen foods. It was evident that in the event spoilage and loss resulted, the new frozen foods industry would get away to a bad start and the development of

(*Concluded on Page 12, Column 4*)

Frigidaire cases of this type are being used in Springfield.

For the MODERN Food Store Refrigerators by McCRAY

WANTED

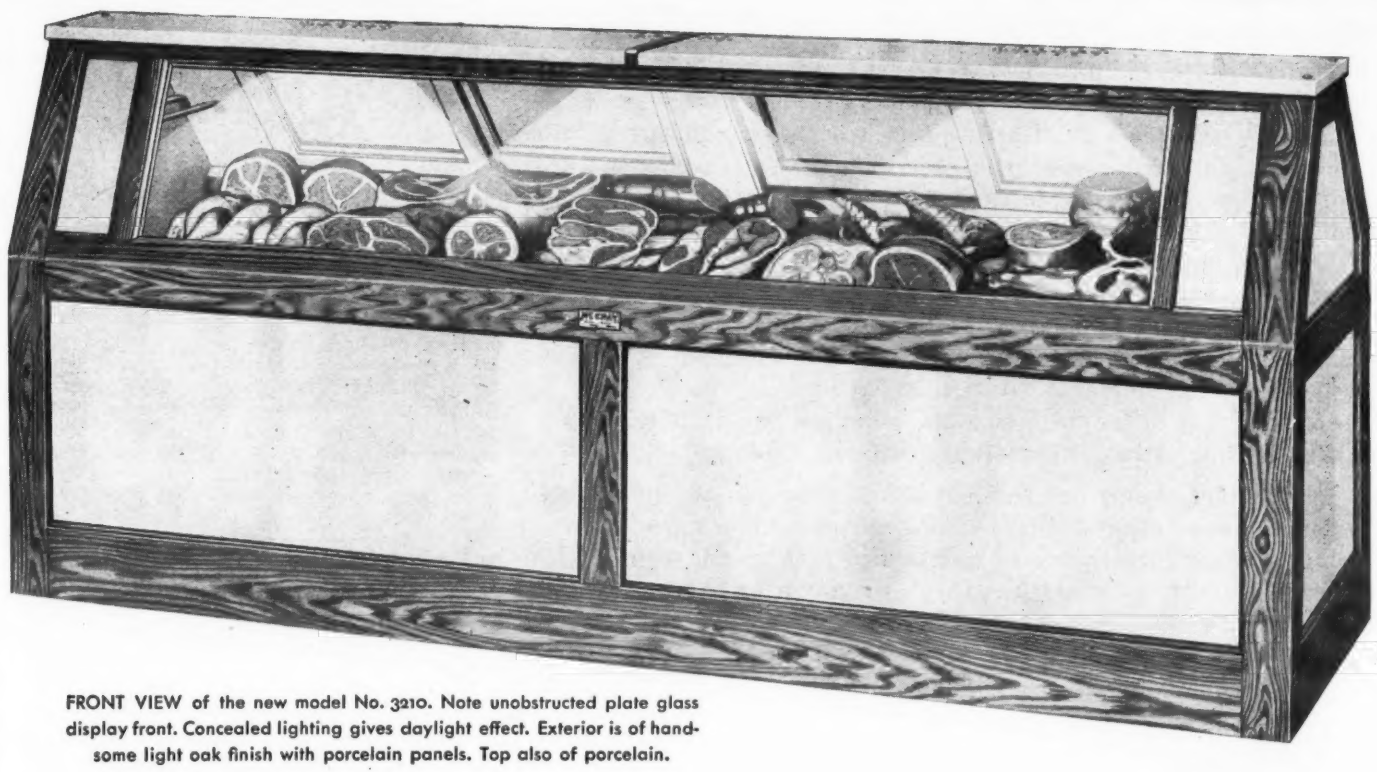
Salesmen and distributors who can see the profit possibilities in the complete McCray line of refrigerators and display cases for every commercial need are invited to write for details about several openings now available. No obligation; get the facts about these opportunities NOW!

HERE is an entirely new creation by McCray—a refrigerator case that combines in one unit the advantages of attractive DISPLAY, with a generous amount of space for refrigerated STORAGE.

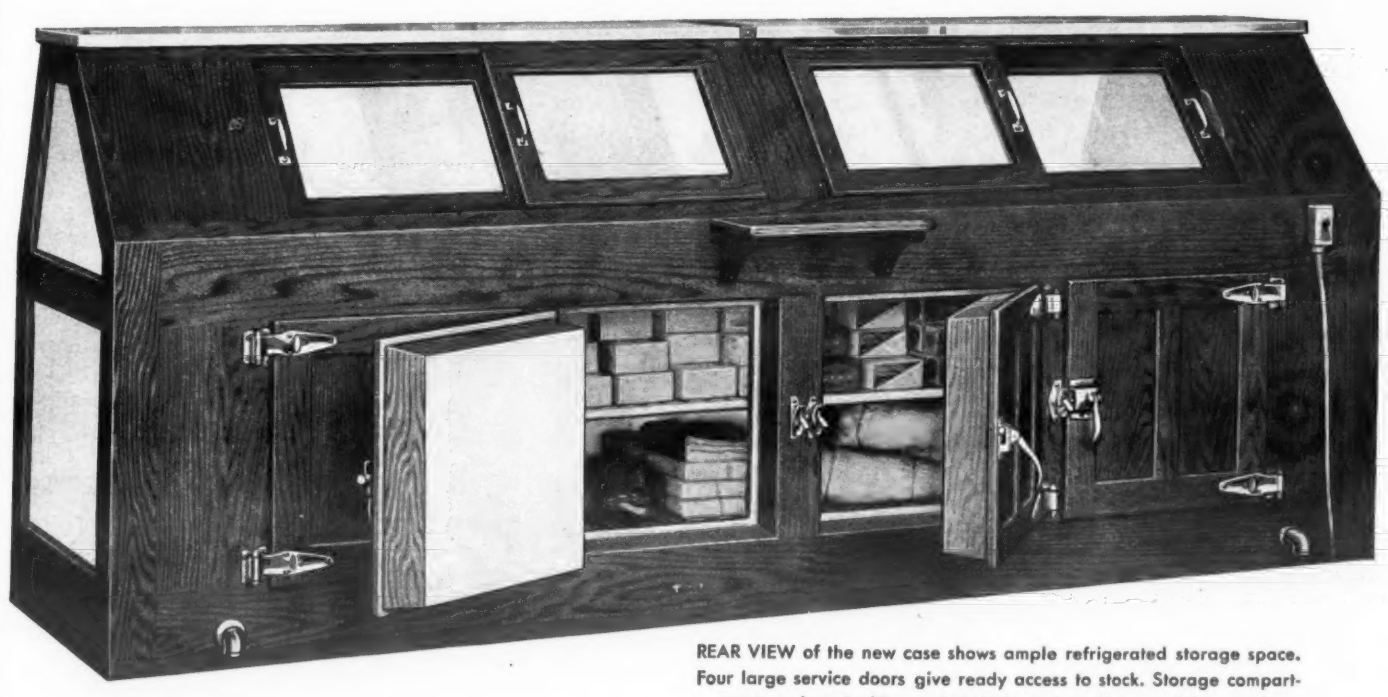
Designed to meet a real need, this new McCray model No. 3210 amply takes care of the requirements of food stores where limited room demands the greatest use of every foot of floor space. In the larger store this case serves adequately as an auxiliary to other equipment.

With a one piece display front of two courses of plate glass and FIFTEEN FEET OF DISPLAY SHELF SPACE, foods can be arranged with telling sales effect. Besides this, there is TWICE THAT AMOUNT OF STORAGE SPACE FOR RESERVE STOCK AND STAPLES. Quick access to this stock is obtained through four service doors in the rear.

And embodied in the new No. 3210 case is the well known McCray standard of construction; quality in every hidden detail which insures thorough, economical refrigeration with spoilage loss eliminated. Food merchants everywhere choose McCray equipment BECAUSE IT MEANS INCREASED SALES AND BIGGER PROFITS.



FRONT VIEW of the new model No. 3210. Note unobstructed plate glass display front. Concealed lighting gives daylight effect. Exterior is of handsome light oak finish with porcelain panels. Top also of porcelain.



REAR VIEW of the new case shows ample refrigerated storage space. Four large service doors give ready access to stock. Storage compartment equipped with wood shelf in center. Also wood floor rack.

For Use with Any Machine

THE McCRAY No. 3210 DISPLAY - STORAGE CASE is built for mechanical refrigeration only. As with all McCray models, any type machine can be immediately installed. No changes are necessary. In this unit, a coil space at each end provides for the cooling of the entire inner compartment. No partition separates the upper and lower sections. Pure corkboard insulation, sealed with hydrolene cement, keeps cold air in and warm air out.

WHATEVER TYPE MACHINE is used, the sterling in-built quality which has characterized the name McCray for 40 years, is a guarantee of the most satisfactory performance. This is of special interest to dealers in mechanical refrigeration as the right equipment is necessary for a successful installation.

McCRAY is the world's largest manufacturer of refrigerators for all purposes. Dealers in machine refrigeration should get the facts now regarding the McCray line. Write for catalogs. No obligation, of course.

McCRAY REFRIGERATOR SALES CORPORATION, Dept. 66, Kendallville, Indiana

SALESROOMS IN ALL PRINCIPAL CITIES (See Telephone Directory)

WORLD'S LARGEST MANUFACTURER OF REFRIGERATORS FOR ALL PURPOSES

McCRAY REFRIGERATORS

REFRIGERATED FOOD SECTION

ELECTRIC REFRIGERATION NEWS

The Business Newspaper of the Refrigeration Industry

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Perplexity

ONE of the chief by-products of any new industry is problems. The quick-frozen food industry seems to be no exception to the rule. It has problems galore.

That is one reason why the NEWS is beginning the publication of a Refrigerated Food section. The industry which has no problem has no great need for a publication. And a business publication with no problems to discuss has little excuse for existence. To be sure it can fill its columns with platitudes, but there is no particular point in doing that. On the other hand, a few healthy problems make a real job for a live business paper. A good problem always creates partisans who will fight with all their strength to prove that they are right, and if there were no business papers they wouldn't have an adequate battle-ground on which to conduct their struggles. Now and then they scrap so venomously that the publication they have selected as the scene of the encounter has to bar them from the premises, but while the war is on, it makes interesting, if not always edifying, reading.

Luckily that is only one phase of the question. In addition to the warriors there are always a large number of sober-minded men in every industry, who use their business paper as a meeting ground for amicable conference, and exchange ideas. They attack the problems, not each other, and rightfully expect that the paper will give space to every point of view. They realize that only thorough discussion plus experience will furnish the final answer to any problem.

There is not room here to list the problems that the quick-frozen food industry has produced in its brief existence. One of the biggest of them is the question of what sort of display and storage cases will be needed to handle quick-frozen food properly. Not through any choice of the editors, but simply because it has forced itself forward, that problem seems to dominate this first Refrigerated Food section of the NEWS. Several long and excellently reasoned articles discuss it. Clarence Birdseye, in his article, devotes considerable space to it; all of the case manufacturers who announce that they have designed or are designing display and storage cases for the new frozen products, refer to it, many of them with deep feeling.

Some of the phases of that dominating problem are mentioned elsewhere. They are almost as many as the leaves on the trees, and there seems to be two or more points of view for every problem. There is no doubt of the fact that there is a tremendous amount of thinking going on.

Those pages of this Refrigerated Food section which carry the announcements of manufacturers have given the manufacturers free rein. No attempt has been made to limit their statements in regard to the expected performance of their equipment. It is evident that they cannot all be right. Only experience can give the true answer.

In the meantime, the pages of this section of the NEWS will be available for discussion of this absorbing problem. This publication will do everything that it can to assist in reaching the solution. The future of quick-frozen food is likely to depend upon the development of suitable equipment for handling it, especially in the hands of the retailer. Only the refrigeration industry with its background of broad experience can furnish the answer.

The producers of quick-frozen food are asking for proper equipment. The makers of refrigerated cases are doing their best to provide it. The Refrigerated Food section furnishes a place where they can get together and pool their experience, and lick that particular problem once and for all.

There will be plenty of others to take up when that one is laid on the shelf.

Refrigerated Food

THIS section of Electric Refrigeraiion News is available to dealers for distribution to their commercial prospects at a cost of $10 per hundred—10 cents per copy.

Food retailers will welcome information on the new developments in food distribution. We suggest that you place copies of this issue in meat markets, groceries, drug stores, ice cream and confectionery establishments, restaurants, hotels, etc.

New Foods Make Their Bow in Davenport

MEAT retailers in the tri-cities, Davenport, Iowa; Moline and Rock Island, Ill., had their first opportunity a short time ago to see the latest developments in the refrigeration industry. Breckenridge, Inc., General Electric's live-wire distributor in Davenport, with the co-operation of the local meat packing branches, exhibited a large quantity of standard packaged meats and foods.

The hard chilled products were kept in the large General Electric commercial refrigerators pictured above. Residents of the tri-cities were on hand to inspect the display. Breckenridge's window and display room were appropriately trimmed for the occasion. D. E. Breckenridge, William H. Schladitz, commercial manager, and R. A. Hannan, central district manager, addressed the meat merchants and pointed out to them how General Electric will help to solve their cooling problems. Sixty-five or more General Electric dealers who attended the spring convention at Davenport also inspected the products on display in the distributor's quarters.

Threshold

(Concluded from Page 1, Column 1)

Working on that theory, Mr. Birdseye established a company for the preparation and marketing of quick-frozen fish. For a time it was not conspicuously successful, and later was reorganized as the General Seafoods Company, which is now a part of the vast General Foods organization.

Carrying on the work begun in the U. S. Bureau of Fisheries, after joining the Atlantic Coast Fisheries Co. Dr. Taylor has developed processes which are being used in the production of quick-frozen fish. For several years these fish have been sold in nearly every part of the United States.

These two companies by their marketing of frozen fillets of fish, have shown the way to the other branches of the food industry, which now have entered, or are preparing to enter, the production and sale of quick frozen food. Both General Foods and the Atlantic Coast Fisheries freeze their products by placing them on metal plates which come in contact with brine. The Birdseye process makes use of plates over and under the food to be frozen, while the Atlantic Coast process has no covering plate. Birdseye Frosted Foods are packaged before freezing, and the Atlantic Coast fillets are frozen first. An article by Mr. Birdseye, elsewhere in this issue, describes some of the details of his process.

Dr. Taylor, who will write an article for a later issue, will doubtless discuss there his process, which includes a special treatment before freezing, designed to prevent the loss by drip while in storage. Other processes will be described from time to time in these columns.

At the moment, the most important development in the quick-frozen food industry is the test campaign being conducted at Springfield, Massachusetts, by the General Foods Corporation. A varied line of meats, fish, vegetables and fruit are being sold in a selected group of stores, and the reactions of the public are being carefully checked. An article telling of the plan of the Springfield campaign was printed in the March 12 issue of ELECTRIC REFRIGERATION NEWS. The progress of the campaign up to date is being covered thoroughly in this issue, and the latest news from Springfield will be carried until the campaign is over. The time limit set by the General Foods Corporation when the sale of quick-frozen food began on March 6, was sixty days.

The presence of vegetables in the list of quick-frozen and packaged foods on sale in Springfield is of particular interest because of the differences that exist between the cells of flesh and of vegetables. Not all vegetables have thus far proved suitable for quick freezing, but experimentation is still going on.

By freezing fruits successfully, the quick-freezing processes have opened up the possibility of freezing and shipping many tropical fruits which now cannot be obtained outside of the tropics. This possibility is only one of the many that quick freezing may bring about in the future.

The quick freezing of meats has intrigued the meat packing industry for some time. About a year ago a special committee from the Institute of American Meat Packers made a trip to Gloucester, Mass., where the General Seafoods Co. has its plant, inspected the workings of the process and later made a report to the Institute. Recently two regional meetings were held, one in Chicago and the other in New York, at which men prominent in the quick-freezing industry spoke. In the meantime, Swift and Wilson are freezing, packaging and marketing quick-frozen foods.

One reason why some of the meat packers see a big future for quick freezing is because it will permit them to cut and package their products at the packing house. This will do away with the shipment at perishable freight rates of bones and other waste products. The immense saving is evident. Then when frozen meats are sold in packages, the name of the packer will appear on each package. He can guarantee quality.

Despite differences in regard to methods of production, everyone identified with quick freezing agrees on one thing. That is the fact that proper equipment must be provided for handling the new products on their way from the producer to the cousumer. As Dr. Taylor has put it, one weak link in the long chain of events between producer and consumer will nullify everything that has gone before.

For that reason, the producers of quick-frozen products are asking the refrigeration industry for suitable equipment for handling quick-frozen foods while being transported, while in storage, while in the hands of the retailers and even after it reaches the home. The part which refrigeration will play in the distribution of food seems destined to be greater than at any time in the past. A new era has begun.

ACCEPTANCE

PUBLIC acceptance of quick-frozen food is being accelerated by the attention given to the new products by publications of wide circulation. Three national magazines, Fortune, The American Magazine and The Ladies' Home Journal, have recently published informative articles on the subject.

The Fortune article, entitled "A Second Ice Age and Its Priestess of Antisepsis," begins on page 62 of the February issue.

"We'll Soon Eat Fresh Fish Two Years Old," by James R. Crowell, appears in the March issue of The American Magazine on page 60, and describes Clarence Birdseye's work in the field in which he has done so much.

In its September, 1929, issue, The Ladies' Home Journal printed an article by Gove Hambidge. It was called "A New Food Process," and it also was largely descriptive of Mr. Birdseye's work.

A large number of trade publications, among them ELECTRIC REFRIGERATION NEWS, have devoted considerable space to quick-frozen food in the last few months. The quick-frozen food bibliography is growing rapidly.

Copeland

THE advent of quick-frozen foods in the retail merchandising market has found Copeland Products, Inc., prepared to meet the problem of maintaining proper temperatures for them during the period they are on display in the merchant's refrigerators or display cases and until they reach the consumer.

The Copeland equipment which is being used for this new phase of refrigeration is the Copeland-Larkin coil, developed in 1929. The coil, as was originally intended and as it is customarily used, eliminates certain undesirable features of electric refrigeration. Dehydration is a minor factor, as it has largely been offset by the type of wrappings in which the foods are marketed. The Copeland-Larkin coils are used to attain low temperatures rapidly, and to maintain them easily. In caring for quick-frozen foods a temperature of 20 degrees is simple with the coil.

The Copeland-Larkin coil is based on the following theories of refrigeration: (1) that maximum refrigerating efficiency is approached as the surface of the refrigerating coil nears a 1 to 1 ratio with the outside of the refrigerated service; (2) temperature of the refrigerating device may be raised in the proportion as it approaches this ratio; (3) greatest refrigeration capacity is obtainable with high suction pressure. The Copeland-Larkin coil contains as many square feet of refrigerating surface as the outside area of the space in which it is installed. Operating suction pressures are comparatively high.

The Copeland-Larkin coil consists of copper coils, around which are assembled thin plates of aluminum. The size of coil and number of plates are determined by the size of the refrigerating space for which they are intended. Standard sizes, based on standard-sized commercial cabinets and cases now on the market, are being produced. Special sizes are provided on order. In all, 56 sizes are produced to fit all varieties of service, storage and display cases and grocery, restaurant, hospital, club and institutional coolers.

According to Copeland officials, the Copeland-Larkin coil is exceptionally well adapted to the preservation of quick-frozen foods, both because of its method of functioning and construction. It is "tailor-made" to fit the chamber in which it is to be installed, thereby insuring ample cooling surface. It moves heat units rapidly and maintains an air temperature only slightly higher than that on its surface. Its 1 to 1 ratio of cooling surface provides an area sufficiently extensive that whatever frosting occurs is spread out so thinly as to reduce this undesirable feature to a minimum.

Copeland-Larkin commercial coils were used in the Hickisch Grocery installation in LaCrosse, Wis., a photo of which appears on page 10 of this section. The Warren case, equipped with these coils and refrigerated by a Copeland air-cooled condensing unit, is used for handling Swift's quick-frozen meats. Temperatures in the case are maintained near the 20 deg. mark.

Pioneer

(Concluded from Page 2, Column 5)

packaged first and frozen afterwards, because only by that means can the packages be compactly filled. If the product is frozen first, it becomes impossible to package the individual irregular fish and unyielding pieces without a large waste of space. Quick-frozen products must be delivered to the consumer before they are allowed to thaw. It is, therefore, essential that they be given the maximum protection against heat penetration in transit. Obviously, an insulated shipping container completely filled with compactly packaged rectangular units affords the maximum protention at the minimum cost.

When quick-frozen packaged products must be held and dispensed under refrigeration in the retailer's store, it is desirable that the packages be economical of space—another argument for the product which has been packaged first and frozen afterwards.

Refrigerated Units for Retail Stores

Refrigerated display and storage units are essential for the proper retailing of quick-frozen packaged products. The General Foods Company has made extensive laboratory and field tests of such units, but has not yet found one which is entirely satisfactory. Perhaps the following outline of our requirements may be helpful to display case manufacturers.

We believe that this retail case should consist of two sections—a display compartment and a storage section. The display compartment should possess the maximum visibility, must be well lighted, and should have a uniform temperature of from about fifteen to twenty degrees Fahrenheit. The products should be dispensed from the display section only occasionally, and therefore no great care need be taken to prevent the glass in the front of the section from fogging when the doors are opened. Moreover, since the method of packaging protects the products from desiccation, no par ticular effort need be made to minimize the convection currents or to maintain a humid atmosphere within the display case.

The storage section should be held at a temperature of from five to ten degrees above zero, Fahrenheit, and must be so arranged as to afford the maximum accessibility for a large variety of products. This accessibility feature is of the great importance and has so far presented the greatest obstacle to the development of a satisfactory case. We have suggested that drawers might be used advantageously.

The Future of Quick Freezing

Although the preparation, storage, transportation, and marketing of quick-frozen packaged seafood products have been on a commercial basis for some time, similar handling of other quick-frozen products is still largely experimental. This revolutionary new method of preservation and distribution has such obviously large possibilities that it has fired the imaginations of many people who know little or nothing about refrigeration problems and who are not conversant with the difficulties which will be met in the introduction of a new quick-frozen product. In other words, this industry is in more danger from its friends than from its enemies. It is not a business to be undertaken lightly by any concern which has not at its disposal very substantial financial and other means which it can devote to the necessary laboratory and field studies and tests.

Quick-frozen products have a tremendous future; more tremendous, I think, than anyone can appreciate who has not lived with them for a long time. On the other hand, if that future is to be realized with the maximum speed and the minimum expense, we must all think well before embarking on the application of quick-freezing principles to new products.

Dry-Ice

As an aid to the producer of food, especially meats, who desires to make his own tests of quick freezing at a moderate expense, the Dry-Ice Corporation of America has devised a method of using Dry-Ice that has the merit of convenience and comparatively low cost.

An insulated box, christened the "Introductory Meat Freezer," has been built which, when charged with Dry-Ice, can freeze 150 pounds of one-inch cuts in one hour. This quantity is large enough to enable the packer to make merchandising experiments with the quick-frozen product.

The speed and economy of operation achieved by the introductory meat freezer arise from the unusual properties of the Dry-Ice used as its refrigerant. Dry-Ice is the trademarked name of the Dry-Ice Corporation of America for solidified carbon dioxide. The solidified blocks have a temperature of 109.6 degrees below zero F.—141.6 degrees colder than water ice—and on melting turn directly to gas, without giving off any liquid.

The bottom of the introductory meat freezer is filled with eight 10-inch cubes of this Dry-Ice, and the cuts to be frozen rest on an aluminum plate laid over the refrigerant. A hinged metal box containing more Dry-Ice is laid over the meat, and wood spacer between the cuts regulate the depth of the freezing chamber. The product is frozen, both through direct contact with the metallic Dry-Ice containers and the circulation of cold carbon dioxide gas.

A few examples will indicate the speed of operation. Fish fillets ⅝ inch thick are frozen in from 3 to 5 minutes. Pork chops one inch thick freeze in from 10 to 12 minutes. Heavier cuts require somewhat longer times.

Consumption and cost of Dry-Ice used may be judged from the consumption of the box standing empty. This amounts to approximately 75 pounds a day, costing $4.00 on a delivered basis in larger centers. Exhaustive experiments made under typical operating conditions, by the Dry-Ice Corporation, obtained net yields between 2 and 5 pounds of frozen products for every pound of Dry-Ice consumed.

The introductory meat freezer is the simplest model of several types which have been worked out. Naturally, the other types, having greater operating conveniences, are slightly higher in cost. This present type will be very low in cost, as single units cost only $300.

The only special operating requirement is that workmen wear gloves when handling Dry-Ice and the metallic containers, to avoid injury from the intense cold. The freezer can be set anywhere, since there is no drainage to consider—the Dry-Ice sublimes directly into harmless, odorless gas.

New Dry-Ice Experimental Freezer

For

preservation

and transportation

of

quick-frozen foods—

Dry-Zero

is the most efficient

and most economical

insulant known

THE ACTUAL FACTS

Tests have been made by impartial national authorities such as U. S. Bureau of Standards, Technical Institutes, State Universities, etc., to ascertain the *insulating value* and *moisture absorption* of commercial insulating materials. Here is a summary of the facts so established, of the materials named:

MATERIAL	INSULATING VALUE	MOISTURE ABSORPTION	(WT. IN LBS. PER CU. FT.)
DRY-ZERO	4.15 to 4.3	14	2
Corkboard	3.1 to 3.3	28	9.5 to 12
Wood fibre board Flax fibre board Cane fibre board Mineral wool slab	2.7 to 3.3	66 to 115	13 to 17

DRY-ZERO CORPORATION, 130 N. Wells St., Chicago, Illinois

DRY·ZERO

THE MOST EFFICIENT COMMERCIAL INSULANT KNOWN

Display and Storage Cases for Quick Frozen Food

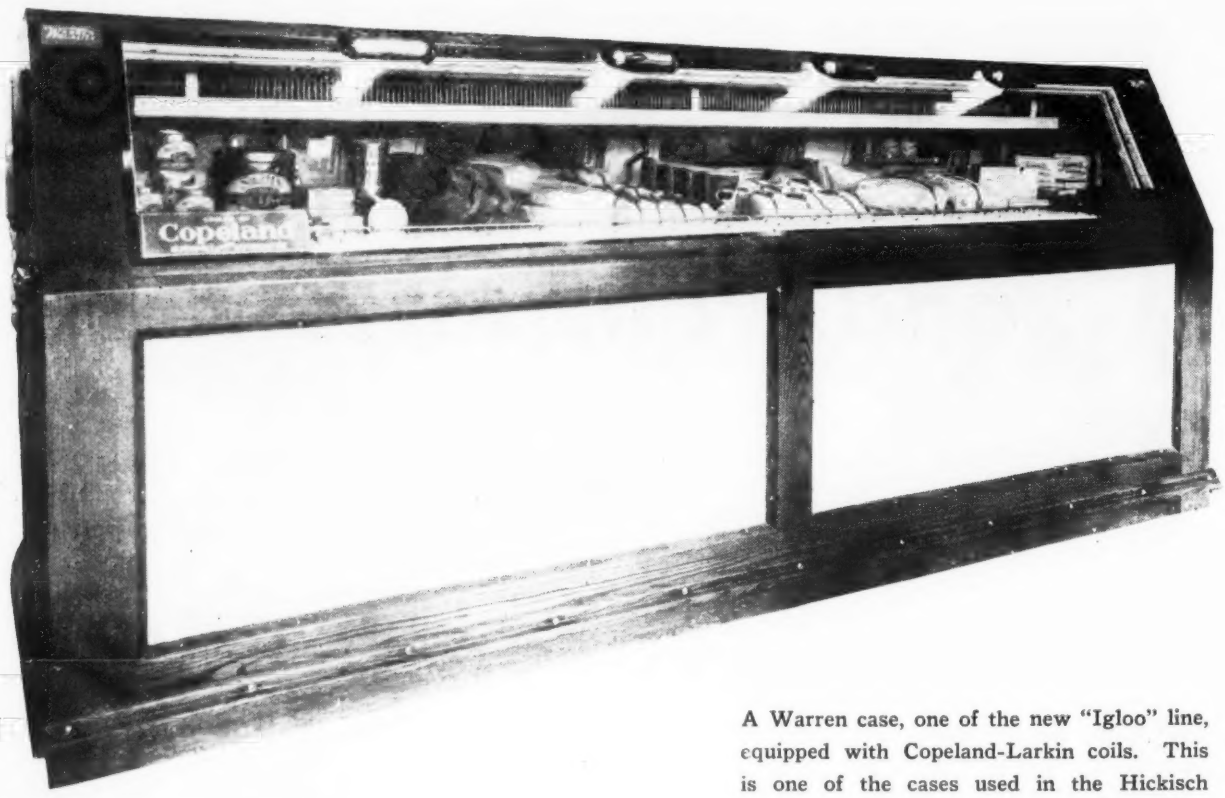
Copeland-Warren

ONE of the earliest quick-frozen food installations in a retail establishment in the Middle West, according to Swift & Company, Chicago meat packers, is that in the Hickisch Grocery in LaCrosse, Wis. Copeland refrigeration equipment and a specially built cabinet are employed to preserve, store and display the quick-frozen foods.

The installation consists of two Warren "Igloo"-type frozen meat cases, one 10 feet long, the other 8 feet; one large vegetable box in the display window; one Copeland X air-cooled condensing unit and Copeland-Larkin coils of a size to furnish refrigeration on a 1 to 1 ratio for the cabinets to be chilled. Temperatures in the Igloo cases are maintained at 20 degrees.

The installation has attracted much attention from customers of the Hickisch Grocery, who, according to the management, are displaying great interest in and doing considerable buying of the quick-frozen foods. It is also receiving considerable attention from other grocers and meat market men in LaCrosse, where the Hickisch establishment is considered one of the outstanding food stores in the state. Tentative orders for eight similar installations are reported by Clark-Bracken, Inc., LaCrosse representatives of Copeland Products, Inc., who directed the Hickisch installation.

As pointed out elsewhere, there is great diversity of opinion in regard to the design and construction of cases for handling quick-frozen foods. Because the whole subject is so new, and standards can be set up only as a result of experience, the statements of manufacturers in regard to their products are printed here, with little or no editing. They should be read with that fact in mind.



A Warren case, one of the new "Igloo" line, equipped with Copeland-Larkin coils. This is one of the cases used in the Hickisch Grocery at La Crosse, Wisconsin, where Swift's quick-frozen meats were displayed.

Blazek

BLAZEK & Company, Chicago, Ill., have announced a counter for the display and storage of quick frozen products. The Blazek style "H" counter can be had in lengths from 8 to 16 feet. One of these counters was used by a large packer in experimenting with the new frozen products.

Harry H. Dobry, of the Blazek Company, in describing this model, says: "Our style 'H' counter is constructed and insulated to maintain temperatures in the display and storage compartment well below freezing. In an experiment, a temperature between 22° and 24° was maintained in the display portion and a temperature between 18° and 22° below freezing in the storage portion. The counter, however, is capable of maintaining temperatures far below these temperatures. However, it is our understanding that it is most satisfactory to properly preserve quick frozen meats at these temperatures.

"This refrigerated counter differs from most of our other refrigerated counters in that it is insulated with a greater amount of corkboard and is completely insulated except for the front of the display and the access doors to the display at the back.

"It also has provision for two sets of cooling coils, one above the display compartment and the other above the storage compartment. The drip pans below this space are insulated and designed to stimulate the circulation of air."

The upper portion of the counter is arranged for a display and the lower part arranged for storage. If desired, counter can be furnished with the lower portion also arranged for a display.

The front of the display compartment is glazed with three thicknesses of heavy plate glass with air spaces between the plates, and set in special cement so as to make the spaces between the plate glass air tight.

The entire exterior of the counter is built of properly seasoned oak. It is panelled with white vitrolite glass below the display, at the ends and on the top. The base is faced with 6-inch high white imported Italian marble.

The floor, walls, ends, top and the hinged doors are insulated with 3 inches and 4 inches of corkboard and six layers of heavy insulating paper. Sliding doors are provided at the back, leading into the display compartment, and hinged doors to the storage compartment.

The frames of the sliding doors are built of 1¾-inch lumber and fitted with three lights of glass. The bottom of the doors are equipped with ball-bearing sheaves, and slide on brass tracking. These doors are provided with specially designed German silver push handles, and prevent the possibility of injury to the operator's hands when more than one operator attempts to use the same set of doors at the same time.

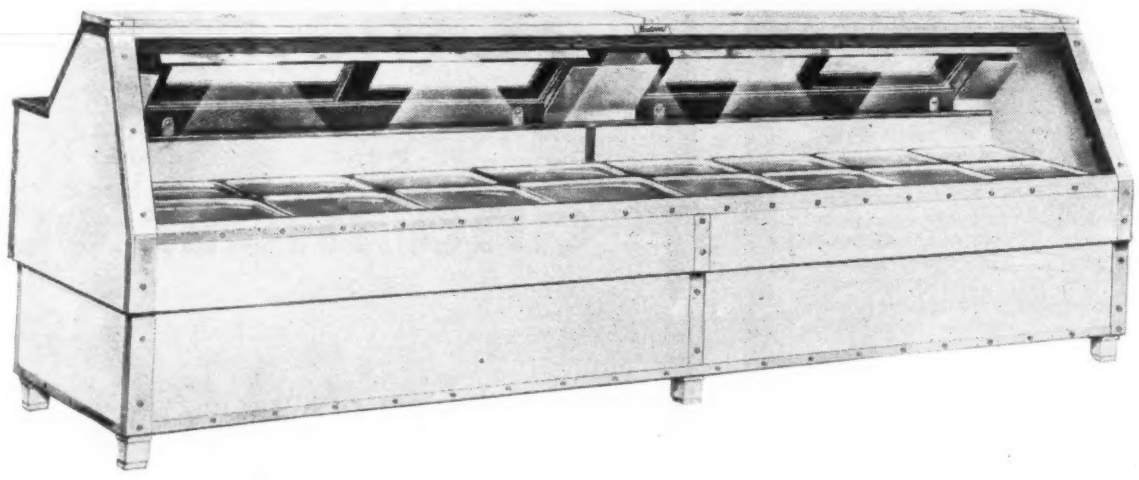
Doors leading into the storage compartment have 1⅛-inch overlap, with a rubberized gasket all around so as to make them air tight when closed. The hinges are made of solid bronze, polished and nickel-plate and equipped with ball-bearings.

Provision for cooling coils is made directly beneath the top of the counter, and also directly beneath the shelves in the display compartment. Cork insulated decks are provided directly beneath the coil space to stimulate the circulation of the air and for gathering the drainage from the coils when defrosting. The upper deck or drip pan is designed with a cold air duct in the center and warm air ducts along the front and back, similar to the decks used in walk-in refrigerators. A somewhat similar deck is provided beneath the lower coil space.

These decks or drip pans are hinged and can very readily be lowered so that access can be had to the coils. This is a very important factor in the operation of a refrigerated counter under low temperature, as it permits the removal of any excess frost or ice that may form on the coils without the necessity of defrosting the coil.

The display compartment of the counter is electrically illuminated, with the lights arranged on the exterior. The wiring is concealed, so that only the reflectors are exposed. The lights are controlled by a switch built in at the back of the counter.

"By having the coil space arranged in both the display and storage compartment above the shelf space," Mr. Dowbry said, "we are taking advantage of the natural law of the refrigeration in cooling the counter. Cold air, being heavy, its natural tendency is to move downward. Providing such an arrangement insures a constant circulation of the air, which is very essential to properly preserve foods in a refrigerator or refrigerated display counter."



Federal

THE Federal Refrigerator Company, Milwaukee, Wisconsin, recently conducted interesting experiments, with a view toward finding out the possibilities of using its standard No. 301 refrigerated case for the display of frozen meat products.

An eight foot No. 301 T. D. counter was taken right out of stock and connected with a Lipman No. 50 Jr. refrigerating machine. The test was started at 1:30 P. M. on January 7, 1930, and was run continuously for one week. At 5 P. M. of the first day, or in three and one-half hours' operation, the temperature at a point directly above the display trays was pulled down from 76° F. to 20° F. and was held between 20° and 26° F. during the duration of the test. The room temperature for the entire period averaged 75° F.

These results, according to officials of the company, are gratifying, due to the fact that a stock case with but two lights of glass and standard thickness of insulation was used. The ease with which low temperatures were obtained and maintained, they claim, is due to the Federal double or split system of air circulation.

Two excellent charts, showing the performance of the Federal equipment in the tests referred to, accompanied the data given above, but they were of such a size that it was impossible to make engravings of them that would be legible in the space available.

Ligonier

ENGINEERS of the Ligonier Refrigerator Co., Ligonier, Ind., are working on a double duty counter for quick-frozen meats. This counter has storage and display facilities for the new packaged meats.

The storage compartment, directly below the space devoted to display, is accessible through two hinged doors in the rear. In this compartment provisions are being made for electric illumination, and shelves are arranged on the floor. A coil just under the front of the display shelves cools this space.

External electric illumination is a feature of the new display section. The coil here is overhead and access to display and coils is through the rear doors. Steel shelves are finished in white porcelain.

The new Ligonier cases have 5" walls and sheet cork insulation. The compressor compartment at the right end of the case is not standard equipment.

Gibson

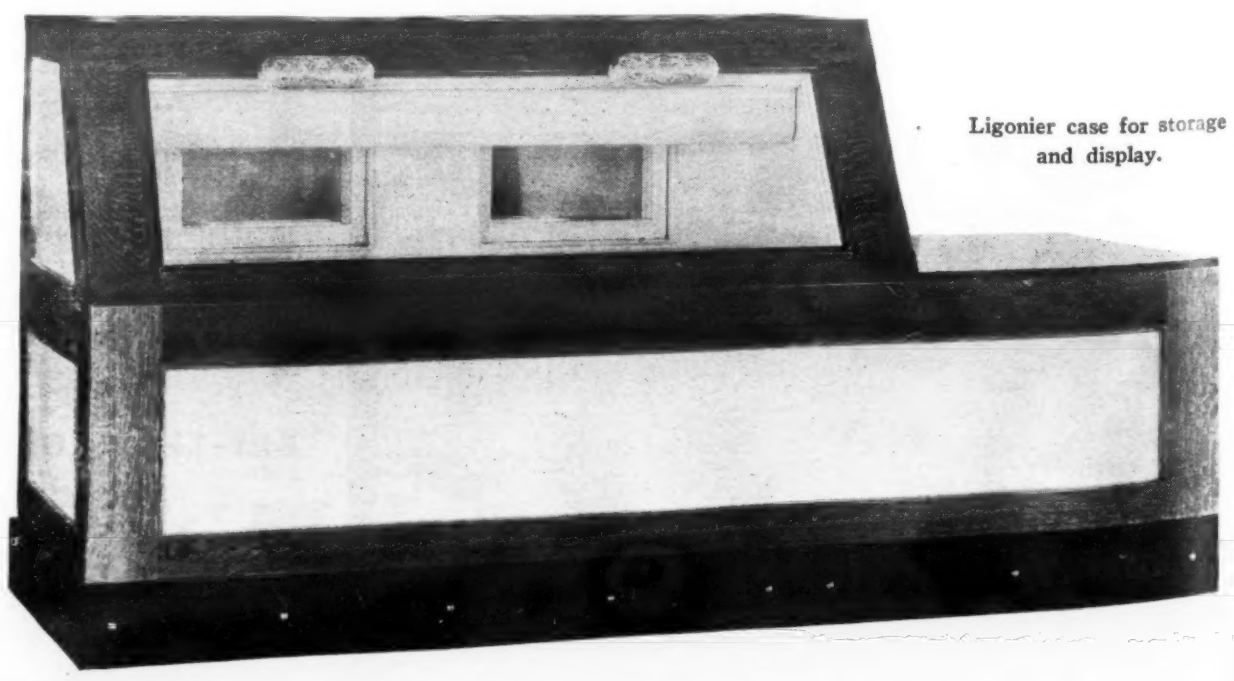
THE research and engineering departments of the Gibson Refrigerator Company, Greenville, Mich., have developed a special type of display case to preserve quick-frozen foods.

The Gibson company has been working for some time with a number of the large manufacturers of mechanical refrigeration, as well as with the packing interests in building storage cabinets and display cases which will maintain temperatures sufficiently low to hold this food in the same condition that it is received from the distributors.

The Gibson engineers are conducting tests under varying conditions in order to meet every individual requirement for this type of refrigeration.

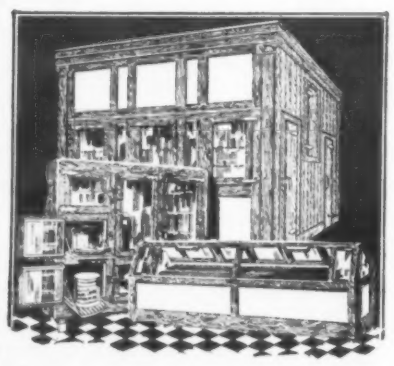
These new display cabinets are being constructed to maintain temperatures of from 21 degrees to 24 deg., F., above zero. Announcement regarding these new Gibson display cases for quick-frozen foods will be made in the very near future, immediately after laboratory tests have been completed.

Realization of the problems involved in the construction of cases suitable for quick-frozen food has caused the delay.

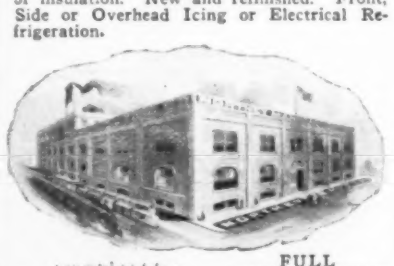


Ligonier case for storage and display.

NORTHEY COOLERS
REFRIGERATORS--DISPLAY CASES
FOR ICE OR ARTIFICIAL USE
For Natural or Frozen Meats



For any purpose—in any size, style, finish or insulation. New and refinished. Front, Side or Overhead Icing or Electrical Refrigeration.



NORTHEY "PATENT COOLER" "SEE THE HUMP"

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Show rooms in most large cities

WRITE TODAY
NORTHEY MFG. CO.
WATERLOO, IOWA

"WATERLOO DIRECT TO YOU"
REPRESENTATIVES WANTED

PROFUSION OF PROBLEMS FOR DESIGNER

By D. E. Rutishauser

THE economical and satisfactory handling of frozen food products brings upon the refrigerator manufacturer not one or two problems, but numerous combinations of problems not confined entirely to his own industry. Therefore, in the design of lower temperature equipment, we have carefully considered all available information about the products themselves with their individual peculiarities, and in our laboratory have tested the various methods of refrigeration to determine their limitations.

Adherence to the old standards in display design has been questioned by some producers and merchandisers of frozen food products, but the general opinion seems to lean toward the handling of the new products in a manner similar to that which is at present employed, and with which the housewife is fully familiar, rather than to attempt to educate the public on both the new food and a new method of service.

Proceeding on the above basis and acknowledging that the small stores in remote places, as well as the large stores in the cities, will all eventually sell frozen food products, we find that equipment must be brought forth in the following combinations to satisfy the present wide range of users and their contemplated methods of handling the new products. Public acceptance and actual experience in the next twelve months will very materially affect the following listing, but for the present there seems to be sufficient demand to give each one serious consideration:

Serviceable Display and Separate Storage.

Serviceable Display and Combined Storage.

Permanent Non-Serviceable Display and Combined Serviceable Storage.

Serviceable or Permanent Display, with either Separate or Combined Storage for Self-Service.

Of the above equipment, the serviceable display and serviceable storage when designed similar to present standards of size and outline, undoubtedly involves the greatest problem. Fortunately for us, however, we have manufactured display cases in which below freezing temperatures have been used for the past twenty years. The experience gained in the marketing of this equipment has given us an invaluable fund of information to serve as a guide in the design of our new frozen food products equipment.

The question of air circulation in connection with this work is probably the most widely discussed of all the problems, and correct circulation is of decided advantage in obtaining uniformity of temperature where desired. Careful consideration must be given to the natural circulation due to refrigeration, also to the disrupted circulation resulting from service in the container, in order to insure visibility through the glass without fogging, and to prevent undue precipitation of moisture resulting from warm air in contact with cold exposed parts of the equipment. In addition to this, circulation will help materially in confining the low temperature air within that portion of the container where insulation materials having the highest heat resistance are used.

The design of serviceable display equipment is particularly difficult in that a good percentage of the exposed surface is glass, usually with three or more thicknesses, and if the proper conditions of moisture and temperature are present at either of the exposed surfaces or between the glass, a fogging or sweating will occur. This condition results in poor visibility and shortens the life of the equipment. Furthermore, if the service doors are not properly located on the fixtures, an additional refrigerating load will be placed upon the mechanical cooling units through allowing the cold air to escape. When the doors are opened, and where service is heavy for even short periods, a wide fluctuation in temperature will result which is not a desirable feature. The ideal design for equipment of this type would permit only the loss of a few degrees if the service doors were removed entirely during the rush hours.

With the problems involved in construction surveyed and appreciated, we come to the cooling of this equipment from the mechanical refrigeration standpoint. Tests in our laboratory have revealed the fact that although the present low sides could be built to do the work so far as capacity is concerned, they will be seriously handicapped without the usual defrosting between cycles.

Numerous suggestions have been brought forth by the refrigerating industry, and those most successful in tests to date have employed the by-passing of the high temperature gas through the cooling units to accomplish the defrosting. The defrosting action was hastened considerably by permitting the compressor to operate during the time the by-pass valves were open. This method can only be employed with cooling units using the direct expansion system, but it was connected in such a manner as to defrost the various sets of coils individually or collectively, depending upon the valving arrangement.

This high temperature gas defrosting, although manually operated in our test work, will undoubtedly become an automatic operation as new devices and controls are worked out. Due to the fact that this operation requires only a few minutes to defrost the coils, the tem-

(Concluded on Page 16, Column 5)

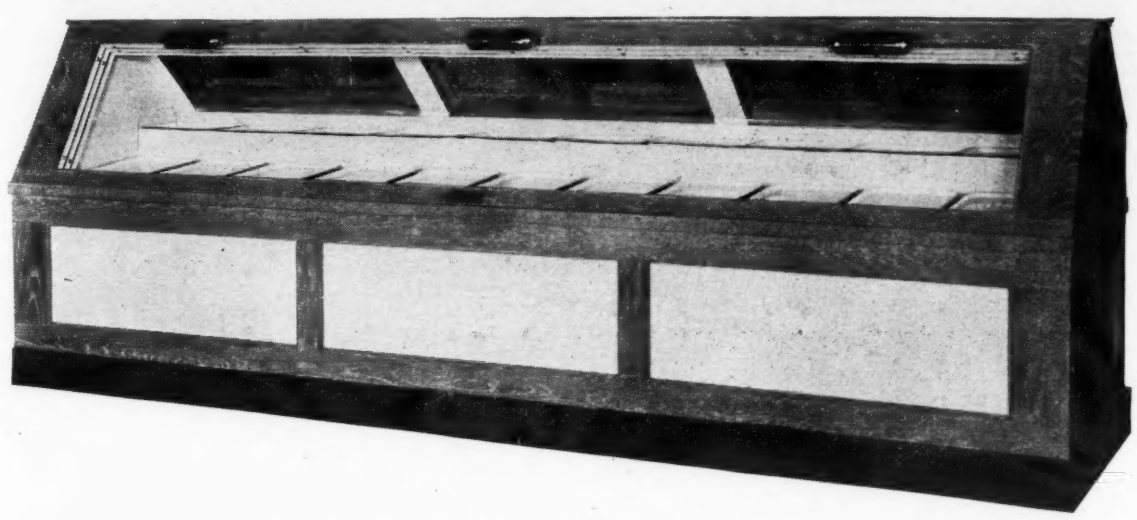
Ehrlich

A NEW display case with two separate insulated compartments has been constructed by H. Ehrlich & Sons Manufacturing Co., St. Joseph, Mo., for the retailer of quick-frozen foods. This model, No. 2100, is available in 5, 8, 10 and 12 foot lengths.

The top display section and the storage section in the base are refrigerated separately. The insulated bottom of the top section forms the insulated top of the base compartment, making two separate sections. This enables the user to work from the storage compartment and not disturb the temperature in the display section.

This top display case is insulated with corkboard, and all joints are sealed with asphaltum. Two sheets of heavy waterproof sheathing are also used on each side of the corkboard. Interior lining is of heavy 28 gauge steel.

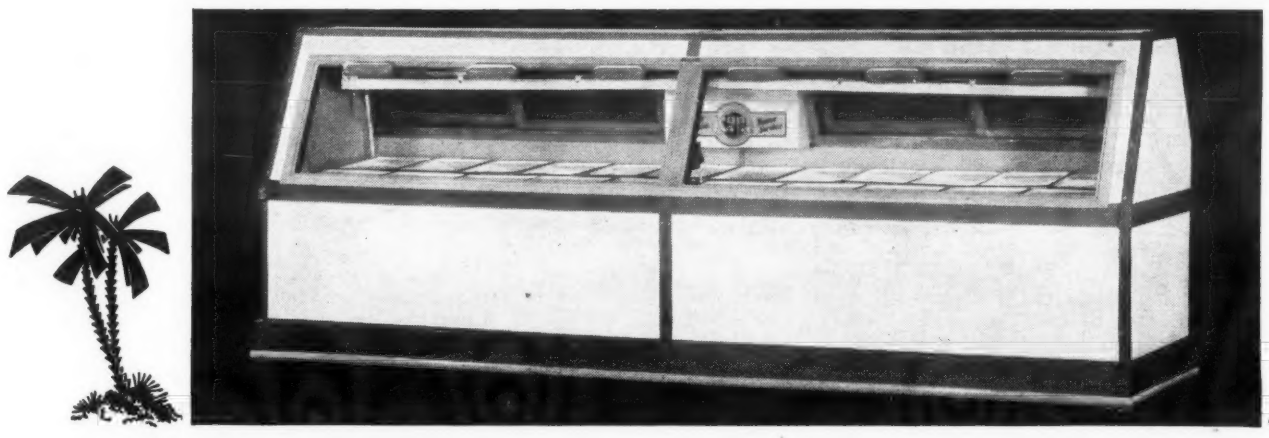
Display and Storage Sections are Separated by Insulation in Ehrlich Cases



In placing the drains in both the upper and lower sections, they are so constructed that a quantity of water received by the drip from the coils will stand in the pockets left for this purpose and in that way hold the moisture in the case.

Model No. 2100 has three lights of heavy plate glass in front set against rubber and on cork. The case comes fully equipped with electric lights and nickel-plated reflectors. All hardware is nickel-plated. White enamel platters are included, and the exterior of the case is in a Silvertone finish.

Tested and Proven *in a* TROPICAL Climate!

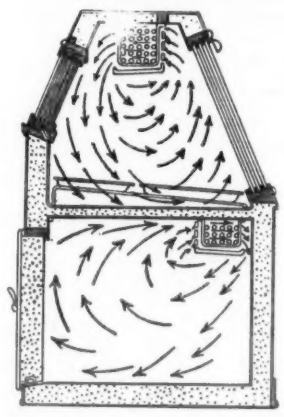


Overhead Refrigeration with Louvre baffle design

means *Controlled* air circulation . . . *Controlled* heat units . . . *Controlled* humidity!

KOOL KASE gives the merchant these tested and proven advantages in freezer display case value:

1. Easy Sliding "Air Sealed" Doors:
Due to the pyramid design of the Kool Kase top section, opening the doors does not warm up the interior. Easy sliding "air sealed" doors are slanted *away* from the warm outside air currents—while *inside* the case a blanket of cold air dropping down from the refrigerating coils keeps the outside air from penetrating the display section and reaching the inside glass.



2. No Fogging or Frosting Between Glasses:
Just as a "wall of cold air" is created on the service side of the case, a "wall of warm air" is created on the display side. Louvre baffles placed alongside the refrigerating coils, however, retard the upward circulation of the warmed air from the foods, permitting it to carry away only the heat units and leaving the heavy moist air at the *bottom* of the display section in a literal "blanket of cold."

3. Scientific "Clear Vision" Display:
The heavy plate glass "clear vision" display windows are set in a soft rubber frame and sealed in position under heavy pressure to avoid air leaks. Dead air spaces are dehydrated and sealed, thereby positively eliminating fogging or frosting between the glasses. Incidentally, the front slope of the glass is placed at the correct vision angle for the best display of the foods.

4. Heavy, Welded All-Steel Frame:
The frame is of heavy steel construction, welded and treated to resist rust. This positively eliminates the possibility of warpage, insures complete insulation and reduces annual depreciation to a minimum.

5. Heavy Porcelain Enamel on Steel:
Kool Kase is constructed of form-fitting Armco ingot iron parts, finished inside and outside with sanitary all-porcelain enamel. Easy to keep clean—no refinishing after a period of time.

6. Anticipates All Future Needs:
The design of Kool Kase is so amazingly perfect that it anticipates every present and future need of the progressive meat merchant for years to come.

Complete information upon request:

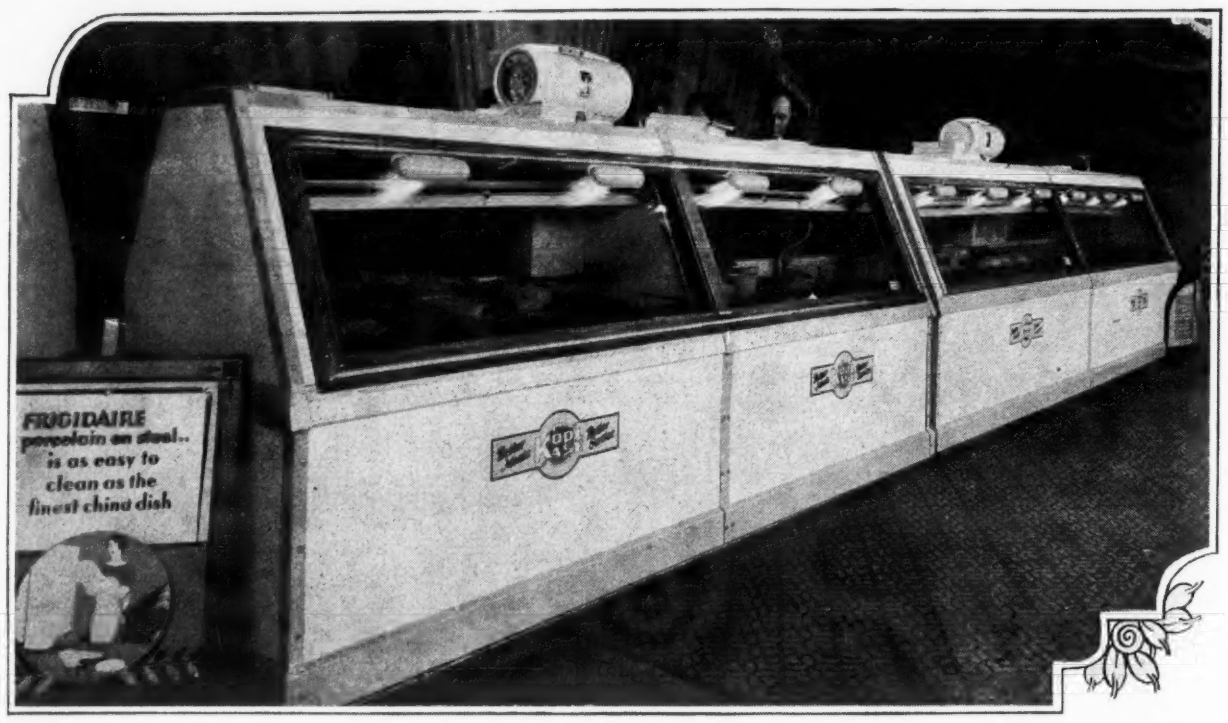
Smoot Holman Co.

GENERAL SALES OFFICES:
1044 So. Olive, Los Angeles, California

Better Foods KOOL KASE Better Service

• Automatic Freezer Display Case •

Smoot-Holman



THE design and construction of the automatic freezer display case, Kool Kase, manufactured on the west coast by Smoot-Holman Co., of Inglewood, California, a suburb of Los Angeles, are the result of considerable experimentation in the handling of frozen foods.

An unusual feature of the case is its overhead system of refrigeration with controlled air circulation. The case proper is of all-steel, all porcelain enamel construction and has many interesting service and display features of particular interest to retail merchants.

Due to its sturdy construction and scientific design, this case (which in ordinary commercial installations maintains operating temperatures around 35 degrees F.) can be refrigerated to zero with an outside temperature of 135 deg. Fahr., and a relative humidity of 85 per cent. According to J. H. Batteiger, of the Smoot-Holman Co., these figures are not a matter of speculation and theory, but of actual tests, conducted by impartial and unprejudiced observers.

"While our freezer display case was first placed on the market in its present form about three years ago," writes Mr. Batteiger, "the recent developments along the lines of hard chilled meats and frozen and frosted vegetables, fruits and fish, have caused us to conduct extensive experimental work, in all of which we have kept uppermost in our minds the following points:

"(1) That temperatures in the display sections of freezer cases capable of handling this class of merchandise successfully must be kept around 16 to 22 deg. Fahr.

"(2) That temperatures in the lower storage sections must be kept around 5 to 12 deg. Fahr.

"(3) That storage and display sections must have independent temperature controls, permitting discontinuing either coil without affecting the refrigerating of the other compartment.

"(4) That the only satisfactory means of eliminating crystallization of any moisture on the food products is through automatically controlled air circulation.

"(5) That automatically controlled air circulation enables the refrigerant to refrigerate the product instead of the product refrigerating the case.

"(6) That the display section must be designed to maintain necessary low temperatures even during the time the sliding doors are open for service, to avoid excessive running time of the refrigerating machine.

"(7) That the source of refrigeration must be so placed that it will take full advantage of the natural law governing the tendency of warm air to rise and cold air to drop down.

"(8) That fogging or frosting of the inside plate glass when the sliding service doors are opened would not be tolerated.

"(9) That fogging or frosting between glasses when operating at necessary low temperatures must be avoided.

"(10) That fogging or frosting, or the collecting of excess moisture on the exterior of the glass under normal humidity conditions, would have to be guarded against.

"(11) That, because of the structural strain set up by the exceptionally low temperatures required for indefinite periods, proper insulation would be essential to avoid the possibility of the cases cracking open at the corners.

"(12) That storage and display space must be easily accessible for quick service to customers.

Experiments in Los Angeles

"In our endeavor to reach a solution of the above mentioned problems, and, also to be doubly certain that our present freezer display case complied with each of these extreme demands in all particulars, we made several installations of our cases in Los Angeles show rooms, where hard chilled meats, frozen berries, fish and ice cream were placed on display for the inspection of women's clubs, domestic science teachers, home economics departments of the different newspapers, and of the general public. In addition, several of our cases were installed on the display floors of local packing houses, where they were employed for the convenient storage and display of the new hard chilled products.

"The results of these public demonstrations are now available and offer, we believe, the first authentic data on the subject that has ever been given to the refrigeration world.

"We will review the results noted on one of these installations only: the installation at 39th and Avalon Streets, Los Angeles, which we installed early in February for the Daley chain stores, wherein we maintained four distinct temperatures in four different compartments, each operated by a separate thermostatic control valve, the whole installation being operated by one refrigerating system.

"Even though a great many manufacturers have endeavored to obtain this result, it is my belief that ours is the first accomplishment of its kind—namely, that we were able to maintain a 2 to 6 deg. Fahr. temperature in the ice cream display and storage compartments; 10 to 14 deg. Fahr. temperature in the frozen fruit and berry compartments; 16 to 22 deg. Fahr. in the hard chilled meats, and frozen fish compartments, and an average of 40 to 45 deg. Fahr. in the delicatessen section—*all with a mean outside temperature of 73 deg. Fahr.*

Case Subjected to Hard Service

"This particular installation was subjected to exceptionally hard service, as tests were conducted to ascertain our losses in temperature as well as observations being made to determine to what extent the coils would accumulate frost.

"The severest test was the opening and closing of the sliding doors of the display section of the ice cream compartment every 15 seconds for a period of one-half hour. During this entire period there was a loss of 1 deg. of temperature in the display section and no accumulation of moisture on either the inside or the outside of the glass in the front of the case.

"From observations made on the accumulation of frost, it appears that the coils would have to be defrosted approximately once every six weeks.

"The fact that our standard commercial cases, with only a few changes, can be made to give such remarkable performance under as severe conditions as the above, is due largely to the overhead system of refrigeration, with controlled air circulation. Briefly, this type of design is explained as follows:

Blanket of Cold Air

"The refrigerating coil in our cases is installed at the top of the pyamided display section. Due to the fact that the base of the doors extends beyond the point where the cold air from the refrigerating unit drops into the bottom of the display section, a blanket of cold is created between the air inside the case and the outside warm air. Also because the easy-sliding doors are set on a slant, the outside warm air goes straight up and apparently exerts no effort to penetrate the blanket of cold air just inside the doors.

"Now, just as there is a blanket of cold air in the rear or service side of the case, just so is there a wall of slightly warmed air on the front (display) side. The rise of this slightly warmed air is retarded, however, by louver baffles placed on the front side of the refrigerating coil, so that only the heat units from the food are carried away by the "lazy" current of air created, the heavy moist air remaining in the bottom of the display section.

"The net result of this phenomenon is that neither any moisture from the air outside the case nor any moisture from the food inside the case is precipitated on the glass, thereby eliminating fogging or frosting. Fogging between the glasses is prevented by the method of mounting in a soft rubber frame, dehydrating and sealing the dead air spaces thus created, making them impervious to moisture.

"The welded steel frame is thoroughly lined with heavy insulating materials, and the balance of the case is constructed of form-fitting ingot iron parts, porcelain enameled both inside and out. This provides easy to clean features and an enduring rigidity which means longer life. In fact, of all the cases that have been installed to date, not one has yet begun to show the slightest signs of wear, even when subjected to the hardest kind of abuse."

The Downing Manufacturing Co.

of Downing, Wisconsin

ANNOUNCES

That it will soon offer two new *REFRIGERATOR CASES* expressly designed for the proper refrigeration of *QUICK FROZEN MEATS* and other *QUICK FROZEN PRODUCTS.*

We suggest that refrigerator dealers and food establishments plan to inform themselves fully on the new Downing refrigerators. Full details will appear in this publication soon.

VANDOREN ON CASES

(Concluded from Page 6, Column 4)

another new refrigeration field would be seriously retarded.

Furthermore, it was apparent that manufacturers of refrigerating machinery rather than the builders of commercial boxes and display cases would be blamed for any deterioration of frozen foods that took place in the retailer's stock, even though it was held in a box or case not suited to the unusually severe requirements of the new industry.

For this reason Frigidaire Corporation conducted its experimental work along two lines. The first was to develop a refrigerating system that would produce the low constant temperatures that were absolutely necessary and the other was to determine the right type of case, which would not only maintain such temperatures, but would be suited to practical use.

Several months ago, the organization's engineering department was able to develop a refrigerating system and a display case which was almost ideal from the standpoint of refrigeration. Frozen foods placed in both the display section and the storage compartment were held in perfect condition for one hundred days.

This case, designed to give the utmost in refrigeration, afforded a fair amount of display. As the display of the frozen foods in a case is one of the most important merchandising helps in building up public demand for the new food products, a change in design was deemed advisable.

This was comparatively easy, as the refrigerating efficiency of the test case was so high that it was possible to sacrifice some refrigeration in order to gain the desired display. It was well established, right at the inception of the field tests in Springfield, that a display case which would hold frozen foods in good condition for thirty days was probably all that the average retailer would ever require, from a refrigerating standpoint.

Whether it is necessary to design boxes that can be used to hold a permanent display, with the retailer selling from a storage compartment, or to design a display case from which the retailer can sell direct is still an unsettled point. It is probable that certain foods will eventually be sold direct from the display section, while others will be held under a weekly display and the customer will be served from a separate storage box. The special requirements of various ramifications of the new industry, as it develops, will determine this question.

There is still another point for the manufacturer of display cases and storage boxes to consider. Sound judgment would indicate that all refrigeration equipment designed for storage of the new frozen foods should be so designed that it can readily be converted to the refrigeration of fresh perishables, if the user desires. The possible difficulty of inducing small retailers to invest in equipment that can be used only for the refrigeration of frozen foods should not be overlooked.

The temperature range within which frozen foods must be held, if they are to preserve their fresh, attractive appearance, is a very narrow one. A number of surprising bacteriological changes take place if the foods are held very long outside this narrow temperature band. This, of course, creates a very practical problem, which must be met by the case manufacturer and the refrigerating equipment manufacturer working in close co-operation.

While free circulation of air is necessary on ordinary commercial refrigeration, the exact opposite is true in the refrigeration of frozen foods.

Air circulation in the necessary low temperatures tends to build up frost, either on the foods themselves or upon the case. This factor prompted the Frigidaire engineering department to abandon altogether its regular commercial cooling coils and devise an entirely new method of supplying refrigeration for frozen foods. The location and type of doors is naturally affected by this problem of retarding air circulation within the case.

In building a display case for frozen products it is evident that only the best of insulating material be used. It should be thoroughly sealed to safeguard against infiltration of moisture and every other precaution taken to control collection of frost. All material used in construction of the case should be of the best if the equipment is to meet fully the severe demands upon it. From the standpoint of appearance it should harmonize with modern retail equipment.

As the new frozen foods are packaged and can be stored very solidly, a frozen food case may perhaps be a little smaller than a case designed for an equal volume of business in handling fresh meats and other foods. For the present the business would seem to require two sizes of display cases—one for the average store and the other for the store selling a large volume.

It is possible that refrigeration equipment in the frozen foods retail store of the future will be similar to the present two-unit combination of a refrigerated case for display and service storage and a cooler for more lengthy storage. The method of distribution found necessary may govern the next step of the evolution.

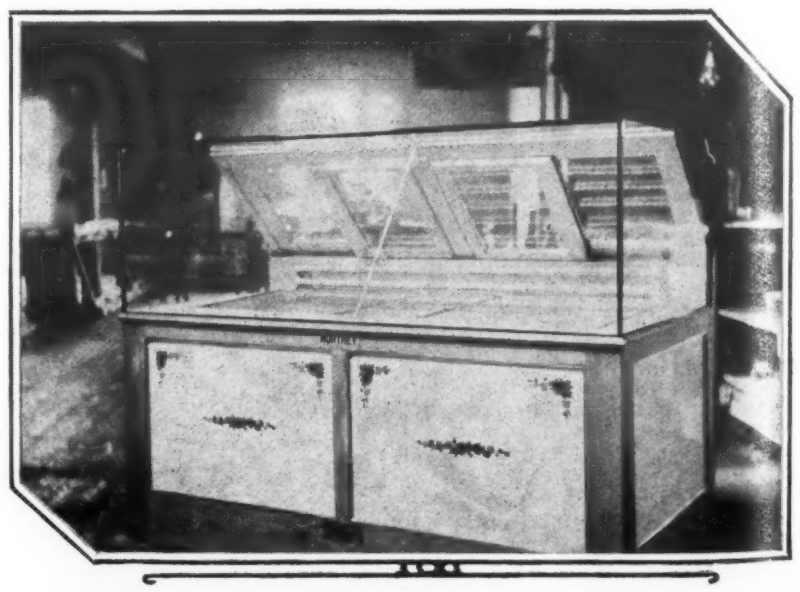
The success Frigidaire Corporation has already met in working out equipment for the refrigeration of frozen foods has been based largely upon experience gained in development of its ice cream cabinet business. In this field, also, heavy duty equipment and unusually low temperatures are necessary.

NORTH AMERICAN CAR CLOSES BIG MONTH

Chicago, Ill.—North American Car Corporation had the largest February business in the history of the company, E. R. Brigham, president, announced on March 3. The average number of cars in operation during the month was 8,600, compared with 5,160 in February of 1929, an increase of 3,700 cars, or over 71 per cent. The total for February, 1930, includes approximately 600 foreign cars, in addition to those owned by the company.

North American Car Corporation operates tank, refrigerator and live poultry cars, and through subsidiaries, ventilated and refrigerated steamships.

Northey



THE Northey Manufacturing Co., Waterloo, Iowa, is making an Isetop counter for frozen meats. This counter is manufactured under the Burrows patent, and tests have been recently made in Waterloo.

In elaborating on the tests, Fred L. Northey, president of the company, states, "That the under side of the shelves in the counter was down as low as 10 degrees above zero. The counter is so arranged that part of it may be used for regular meats, and by lowering the shelves, makes it adaptable for frozen meats. It is made with half-inch plate glass.

"This is not an experiment, because they have been in use for the last four or five years. It is arranged so that it can be made a hot counter by putting steam into the pipes.

"This is the only counter on the market, I believe, that has actually been in use and ready for frozen meats. The James Black Dry Goods Co., of Waterloo, has 68 feet of this counter in use, although it is used principally for regular meats; sometimes the meats are frozen to the platters when careless clerks handle the valves.

"We have an open top counter for self-serve that will handle the frozen meats, also bottled milk, etc., and often we have had to put insulation under the milk bottles to keep them from being broken."

Ford

THE Ford Refrigerator Co., Inc., South Jacksonville, Fla., manufacturers of commercial refrigerators, display cases and water coolers, is working on two different types of cases suitable for the merchandising of quick frozen meats and vegetables. These cases, it is expected, will be ready for the market in a few months.

One of the cases is designed for chain stores retailing the new frozen products, where the customers will be able to serve themselves by opening the doors to the individual package storage compartment. This section will offer storage facilities for the products, samples of which can be viewed in the display at the right end of the case. The customer, after viewing the contents of the display, will decide what product he or she wants and then will proceed to get it out of the storage compartment.

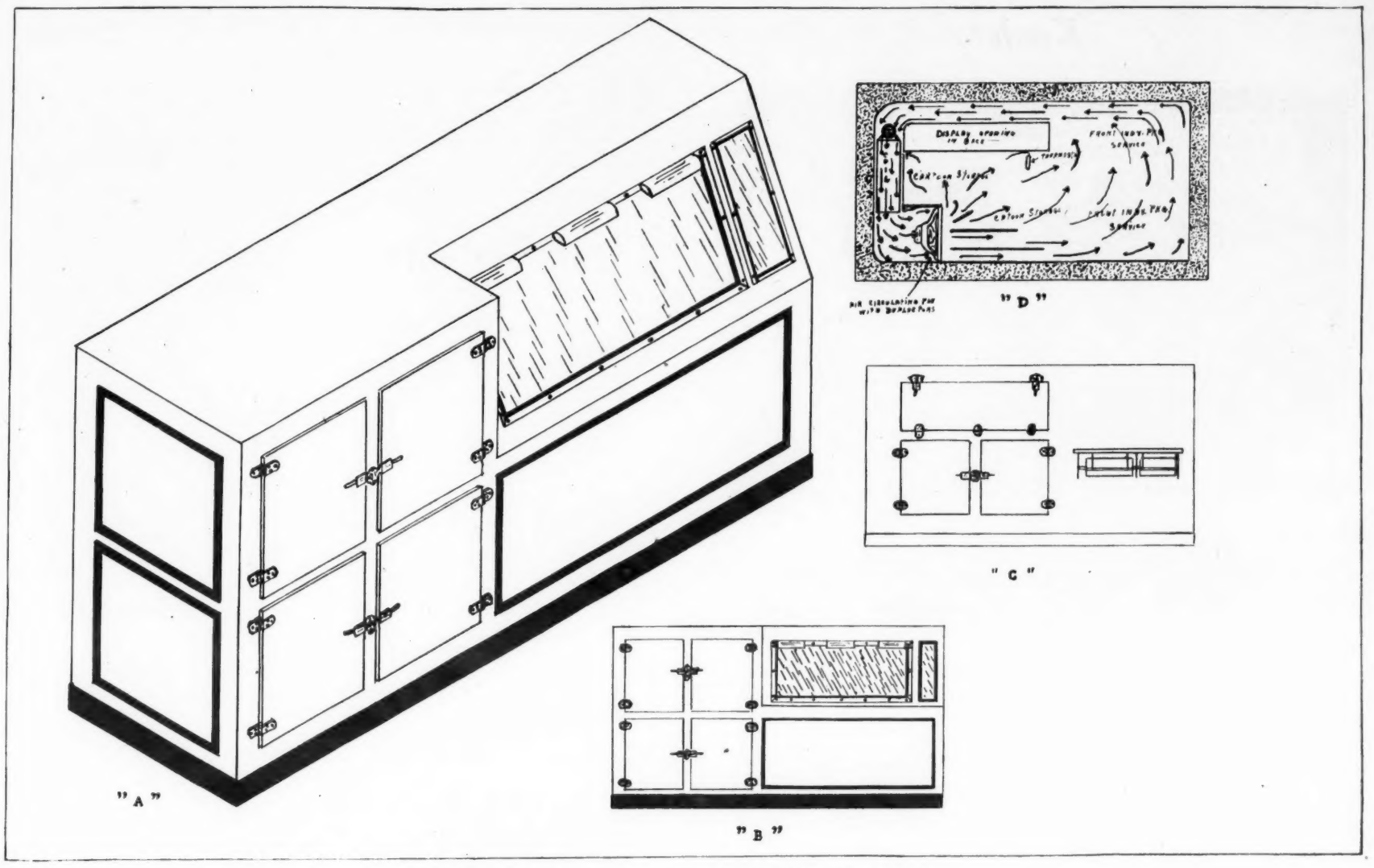
At the right four drawings illustrate the general construction of this case. "A" shows the doors which enable customers to procure the quick-frozen products from the storage. In drawing "C" the small door opening into the display section can be seen. The arrows in drawing "D" indicate the direction of the air circulation. A small air circulating fan with deflectors is visible near the lower left-hand corner of this drawing.

The display will not be accessible to the customer and a small door in the rear of the case permits rearranging the display whenever desired. In this way no moisture laden air will get into the display and condense on the cold walls while the doors are open. Below the display compartment ample space will provide for the storage of carton or bulk.

In this case the method of refrigeration will be of the forced air type, with a thermostatically controlled fan drawing cold air off the low side coil and distributing the air to all parts of the case with the aid of ducts. The low side coils may be either the flooded or expansion type. This case is to be insulated with 5 inches of corkboard, with an all-metal construction throughout. It is planned to offer this model in 10, 12 and 14 foot lengths.

For the independent market, the other case is being designed so that it can be placed right in line with the other cases, thus enabling the butcher to serve the trade from the back of the case. Individual compartments at the ends will provide storage for the packaged goods. Space in the bottom will be available for bulk storage.

In this model a small display with electric light is planned in the center of the case. It will be made in four sizes, 8, 10, 12 and 14 foot lengths, respectively. Construction will be similar to the model previously mentioned.



Ford display and storage counter designed for frozen foods

Hill

CASES which are offered for the handling of quick-frozen food are being made by C. V. Hill & Co., Inc., of Trenton, N. J. One of the recently designed cases is notable for an unusual feature, a revolving cylinder partitioned into shelves. These shelves can be loaded with the products on display, and the motion is sure to attract the eye of the customer who otherwise might pass by. This attention-getting accessory was one of the centers of attraction in the anteroom at the recent quick-frozen food meeting of the Institute of American Meat Packers at the Hotel Pennsylvania.

Hill cases are now being used for handling quick-frozen meats at various points where they are on sale. One of the leading producers of the new products has a Hill case in operation in the department at the home plant where food supplies are sold to its employees.

The Hill organization has been engaged for many years in the production of refrigerated cases and is one of the leading eastern manufacturers in that line.

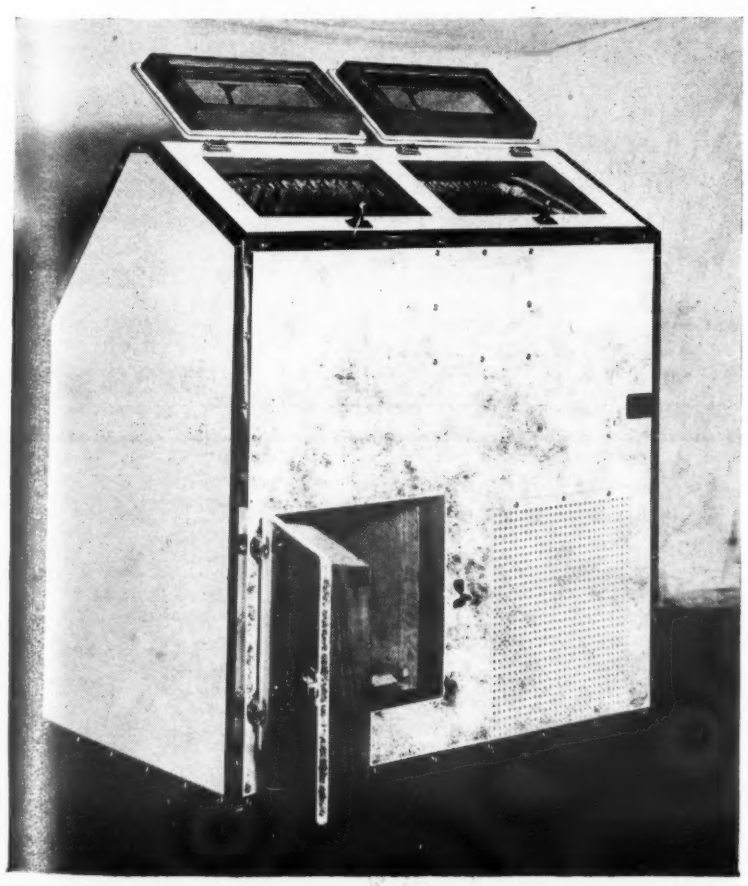
Servel

SERVEL, Inc., has been working on low temperature refrigeration for many months. Although Servel is not in the store display case business, members of the Servel organization have been working in co-operation with prominent show case manufacturers, and have developed in their own laboratory a somewhat different type of case for "frozen foods," which they believe comes closer to meeting the eventual requirements of this new market. One of these preliminary development cases is illustrated on this page.

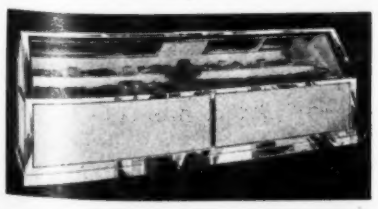
This case meets the requirements of the smaller dealer and the chain store for "frozen food" merchandise. It features small floor space requirements, easily accessible broken package storage space, self-contained unit with good display value for the product, and overcomes one of the big differences in low temperature work of misty glass. This case is so designed that the glass is absolutely mistless. It is designed to be manufactured in quantity production and to sell complete at a very reasonable price.

It is expected that the marketing of "frozen foods" will soon develop to a point where this type of case, Servel equipped, will have real volume sale, and be a very profitable number for the distributor and dealer.

During the preliminary development period, a special Frozen Foods Department has been created in New York, under F. P. Combier, assistant to the president.



Display case which Servel engineers have developed to meet the requirements of the smaller dealer for quick frozen products



DISPLAY COUNTERS
For All Systems of Refrigeration
SPECIAL MODELS for Display and Storage of
QUICK FROZEN FOODS

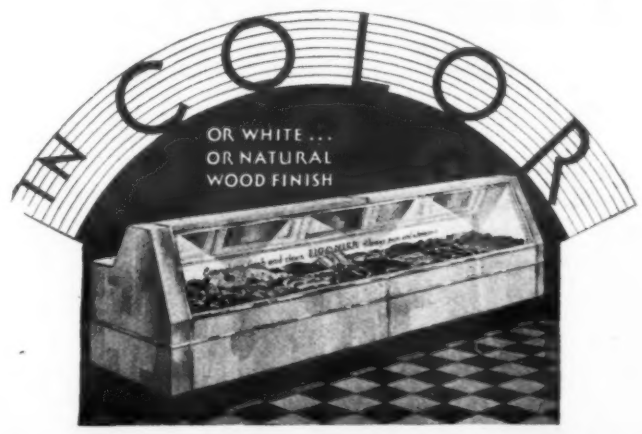
DEALERS WANTED
Liberal discount to dealers. An ideal line to handle in connection with the sale of commercial units. Write for proposition. Catalog sent on request.

KOCH
REFRIGERATORS
North Kansas City, Mo.

We build
DISPLAY AND STORAGE CASES
Especially adapted for
QUICK FROZEN PRODUCTS
Write for Catalog and information
Marsden's Store Fixture House
30 James St. East, Providence, R. I.

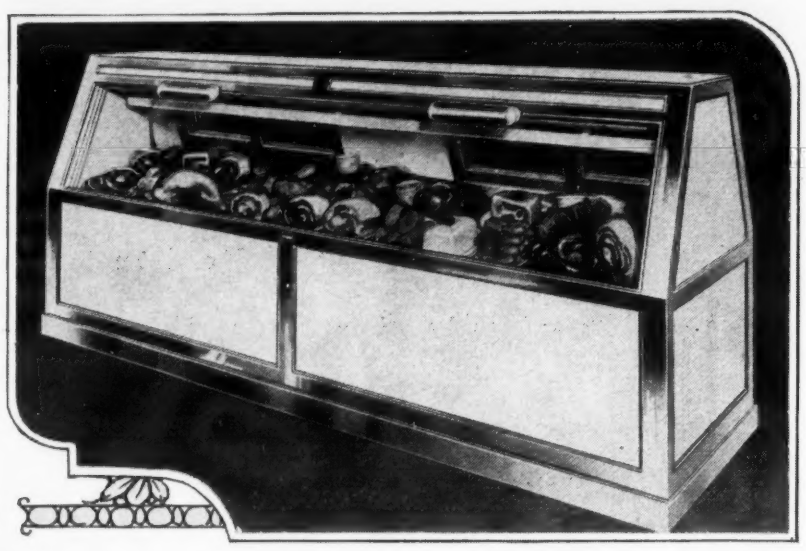
A LIG-O-NIER IS HONEST VALUE

Ligonier Refrigerators are honest value. Expert craftsmen build them for a business lifetime of satisfactory service. Ligonier counters, coolers, and grocery boxes are finely made and look it. Lines evidence skill and taste. Finish is of piano-like lustre. ' ' ' Only the very finest quality can give lasting satisfaction and proper refrigeration results through the years. Inferior materials, construction, and workmanship would tarnish the proud name Ligonier has raised. ' ' ' Completeness and attention to the often unnoticed little things reveal the careful scrutiny that goes into Ligonier manufacturing. There are no rough edges, no crude mortising, no bad joints, no missing parts. Constant checking, constant inspection guarantee this. Everything fits. There is no covering up of carelessness in construction or labor. ' ' ' Ligonier manufacturing ideals are not a figment of the imagination—not a sales argument discovered with difficulty but an integral part of the company ingrained in its very existence. ' ' ' Food merchants get the most for their dollar in Ligonier Refrigerators. Write for catalog and complete information.



LIG-O-NIER
REFRIGERATOR COMPANY
A Division of
ALLIED STORE ASU UTILITIES CO.
LIGONIER, INDIANA
Agencies In All Principal Cities

Koch



THE Koch Butchers' Supply Co., with headquarters at North Kansas City, Mo., has started to manufacture a series of counters for the display and storage of quick frozen foods. Koch engineers have given considerable thought to defrosting and they have incorporated in these cases a means of defrosting the refrigeration coil without appreciably raising the temperature in the display and storage space. When the refrigeration coil needs to be defrosted it can be isolated from the display space so that during the defrosting cycle it does not allow the temperature to rise noticeably in the display space.

The counters in the new series are insulated with four inches of corkboard, and the display is visible through four panes of ¼-inch plate glass set in place by the Koch sweat-proof method. In the new models the display and storage facilities are in one compartment. R. Starr, of the Koch Company, states "that his company believes that 20 degrees F. is suitable for the frozen products, and the new models are designed so that a temperature as low as 15 degrees F. can be easily reached."

TOO LATE

As the NEWS was going to press, several photographs and descriptions were received from case manufacturers not mentioned in this issue. This material will be published in the next Refrigerated Food section.

McCray

PROPER refrigeration for the new packaged frozen foods for the retail store has been given much consideration by the advocates of this new method of merchandising foods—meats in particular.

The McCray Refrigerator Company, Kendallville, Ind., already have on the market, according to a statement made by H. M. Stewart, general manager, a display storage refrigerator case to fill this need.

The McCray engineers did a great deal of research work before they brought this model out. It was designed for one purpose only, and that is to carry a low temperature. A temperature from 16 to 26 degrees can be maintained in it without difficulty.

The general construction is well in keeping with its requirements. It has heavy walls, insulated with corkboard sealed with hydrolene. Exterior, front, top and ends are of snow-white porcelain, trimmed with Monel Metal. The black porcelain base adds to the attractiveness of this case. In the front there are three thicknesses of plate glass, which extends the full length without a single obstruction.

Exterior electric lights are regular equipment. By means of this lighting arrangement every portion of the entire display compartment is perfectly lighted.

This model affords ample space for frozen meats in the display compartment and affords storage space in the lower compartment. It is built for mechanical refrigeration exclusively. There is a coil space in the top of the display compartment and in the front of the storage compartment.

American Ace

BECAUSE of its simplified features, the new American Ace electric refrigerating unit recently put on the market by the American Foundry Equipment Company of Mishawaka, Indiana, is adapted for refrigeration of quick frozen foods.

The American Ace is entirely automatic, fully enclosed, hermetically sealed, and all belts, idlers, stuffing boxes, seals, have been eliminated. The unit is small, compact, and operates with unusual efficiency due to removal of excess friction. The cooling system embodied in the American Ace causes rapid removal of heat from the machine and cuts down the running time considerably.

The American Ace is suited for the refrigeration of any cabinet. It occupies very little space.

A complete refrigerated display case especially designed and constructed for the handling of quick frozen foods and embodying an American Ace unit, is now also announced by the American Foundry Equipment Company. This new complete case is stanchly built with four-inch walls heavily insulated with corkboard—three courses of plate glass and generous storage compartment beneath the display, cooled by separate coils. The compartment for housing the condensing unit can be seen at the left of the display counter. The unit fits in snugly.

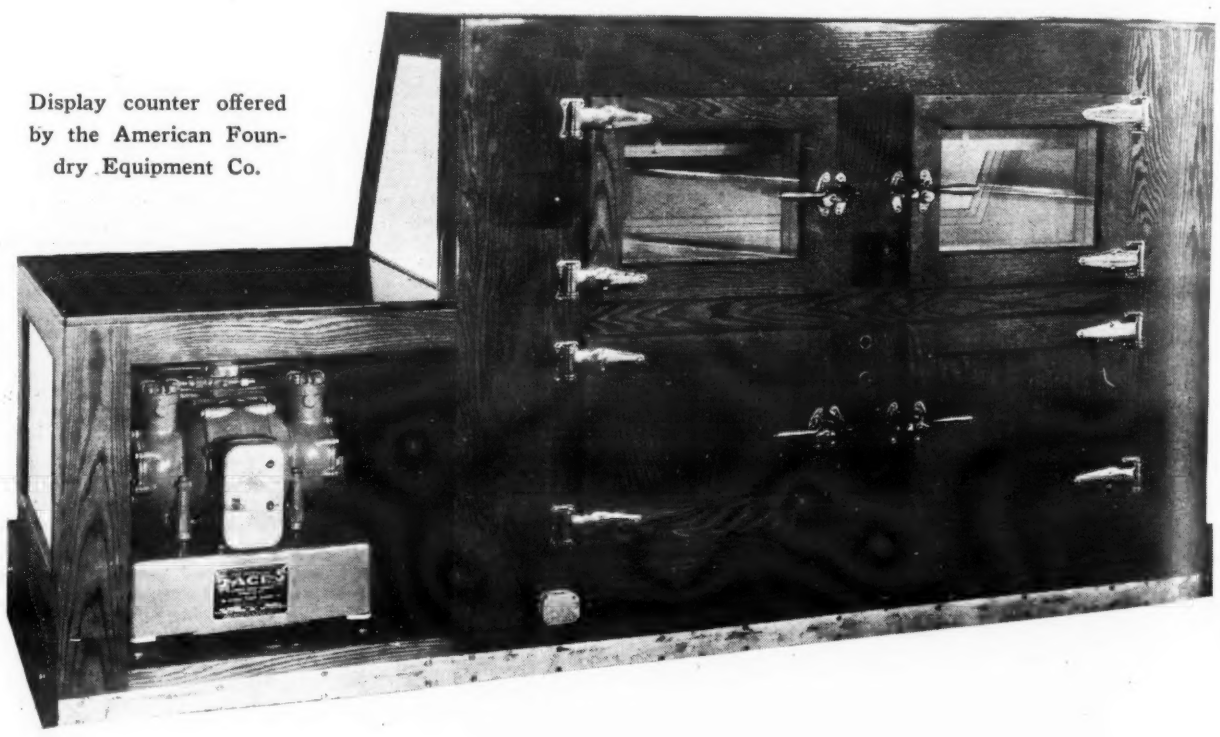
As an added feature, the top of this section can be conveniently used as a wrapping table.

General Electric

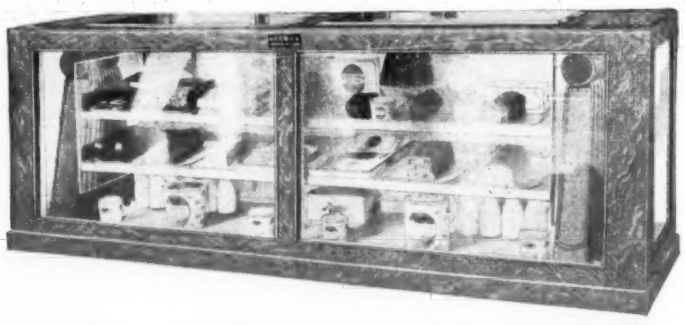
THE General Electric Company for some time has been working on plans for display and storage cases for quick-frozen foods, but at present has no case for this purpose ready for the market. An interesting development in the last few months has been the sale of a large number of G. E. refrigerators, equipped with units which maintain low temperatures, to merchants handling quick-frozen food. These refrigerators, of course, provide no means for display, but they do provide storage for a limited quantity of frozen products.

A number of them are being used in stores which have never handled meats before. They are meeting with success in the job of taking care of a temporary problem, and, of course, will always be useful for extra storage for the packaged meats after they are replaced by G. E. display cases.

Display counter offered by the American Foundry Equipment Co.



It pays you—
because it pays the user



HERRICK
FULL VISION CASE

DESIGNED *for* DISPLAY

Coils at ends, occupy minimum space, at the same time providing maximum refrigeration and circulation. Roomy, sanitary, triple-tinned shelves; glistening, white enamel interior. Shows to best advantage all the foods placed in it, making greatest appeal at the time when the customer is in the buying mood.

BUILT *for* ECONOMY

Heavy insulation. Air-tight doors. Three thicknesses of glass, each set solidly in air-tight plastic. These and other features of construction explain its surprisingly low cost of operation. Four stock sizes—six, eight, ten and twelve feet long.

TURN your potential grocery and market customers into actual buyers by showing how the HERRICK Full Vision Display Case pays for itself.

This specially designed HERRICK case multiplies profits, by increasing sales, at no added sales cost. It has plenty of room for the average stock of foods. It keeps them just as good as they look—and that is good enough to tempt many a dollar from waiting shoppers.

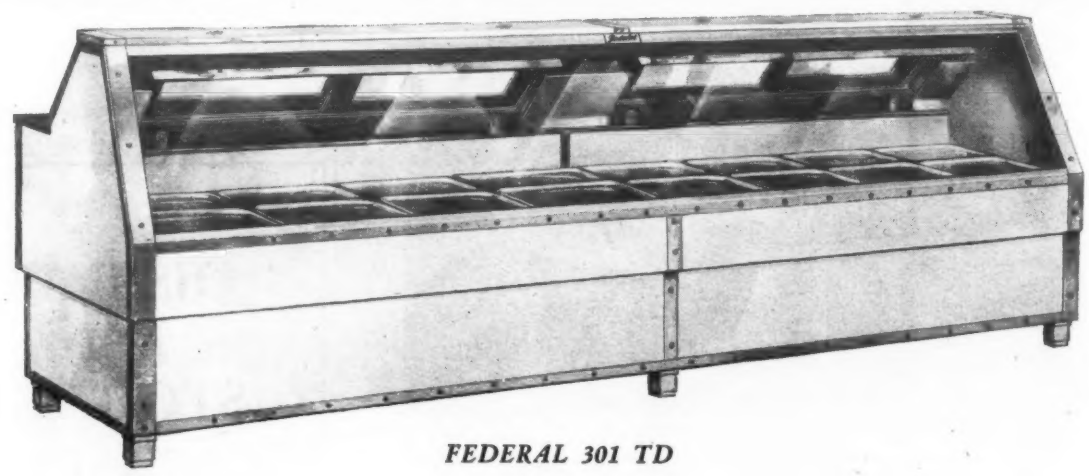
Correctly designed and carefully constructed of selected materials, the HERRICK Full Vision Case greatly reduces spoilage of perishables. Its operating expense will scarcely be noticed on the electric bill.

The name HERRICK on any case or refrigerator designed for mechanical units is enough to recommend it to grocers, hotel and restaurant owners, among whom for two generations it has stood for all that is sturdy and reliable in refrigerator construction.

Ask for catalog of commercial models.

HERRICK REFRIGERATOR CO.

1003 Water St., Waterloo, Iowa



FEDERAL 301 TD

The ideal counter for the proper display and preservation of frozen meats. Properly engineered, sturdily built and reasonably priced.

We have a very attractive dealers arrangement and some good territories are still open.

WRITE

FEDERAL REFRIGERATOR CO.

Division of
FEDERAL ASBESTOS & CORK INSULATION CO.
MILWAUKEE, WIS.

INSULATION INSURES PROTECTION

By Harvey B. Lindsay
President, Dry Zero Corp.

As has been frequently pointed out by authorities on the subject of quick-frozen foods, it is of the highest importance that they should be kept at low temperature—much lower than heretofore used for ordinary perishables. While in the latter case temperatures in the neighborhood of 35 deg. F. to 45 deg. F. have been satisfactory, for quick-frozen foods 20 deg. F. is the maximum, and somewhat below that is desirable.

Equipment, from refrigerator cars and truck bodies to refrigerators and display counters, which were built for carrying the higher temperatures, cannot well maintain these much lower temperatures with any degree of economy, if at all. Economy in their efficient handling is, of course, one of the most important factors in the successful widespread development of quick-frozen foods. Efficiency, to avoid waste, and the attainment of that efficiency at no material increase of cost—these are most important.

There is, of course, but one answer to this requirement, and that is providing equipment with insulation value sufficiently stepped up to meet the need. To rely on increasing the refrigerating effort alone, not only increases costs of handling quick-frozen foods to a wasteful and extravagant degree, but does not do the job itself satisfactorily. To properly increase the insulation value does meet the requirements and with real economy.

We have done a great deal of work on this aspect of the matter in conjunction with leading manufacturers of various refrigerated equipment. This work and resulting actual experience have clearly shown that the maximum conductance (heat entry) permissible, in such equipment, is .08 to .06 for stationary indoor equipment and .06 to .05 for transport and outdoor. (These figures refer to the conductance of the insulation per square foot per 1 degree Fahrenheit difference, per hour. By taking the conductivities of various insulating materials, shown for example in the U. S. Bureau of Standards report or other impartial authorities, and dividing by the thickness in inches, the conductance of a given thickness is obtained. The competent manufacturer also takes into account the moisture absorption values—which are likewise impartially established.)

This work—in preparation for the handling of quick-frozen foods—embraced equipment from railroad refrigerator cars and truck bodies to display counters and refrigerators, so that today most satisfactory and economical results can be and are being obtained, by scientific equipment for these low temperature requirements.

Distribution commences either by refrigerator car or truck. For nearly two years the Safety Refrigerator Cars, designed by The Safety Car Heating and Lighting Company in consultation with the Dry-Zero engineers, have been carrying Nordic fillets and other quick-frozen foods, from coast to coast, with satisfaction. They are refrigerated by the Silica Gel process and well insulated (conductance of insulation .05). They represent a new epoch in railroad transport of food.

The growth of low temperature truck bodies is one of the marked developments of today. Whether refrigeration be by solid CO_2 (Dry Ice, etc.) or by mechanical means, the requisite low temperatures are easily and economically obtained with insulation giving a rating of .06.

In commercial refrigerators an example of the way leaders in that field have already been preparing for this development is indicated by Seeger Refrigerator Company. Seeger commercial refrigerators with insulation rating .06 to .05, are now available after a year of careful study and test. The same thing is being done by the Lorillard Refrigerator Company in the east. Both of these are high quality low operating cost and permanently efficient products.

The display show-case is, of course, an important factor in the distribution of quick-frozen foods. Here high insulation value is again of the utmost importance. This field likewise is getting ready for the new development. Holcomb and Hoke make display cases with the necessary insulation rating. Both unnecessary weight and bulk are eliminated and permanence of high efficiency gained.

Another interesting show-case for quick-frozen foods is the Self-Service case produced by Puffer-Hubbard Company. This is so designed that the air change from service opening has a practically negligible effect on the interior temperature. Being exceptionally well insulated this new case shows a fine efficiency and economy result.

One of the earliest and most prominent producers of quick-frozen fresh fish, the Atlantic Coast Fisheries Co., has had developed by Zerozone Co. of Chicago, in consultation with the Dry-Zero engineers, a most attractive dispensing unit, white enameled. A large number of these have been in service and have consistently held temperatures at about 18 degrees Fahrenheit at an exceedingly small refrigerating cost.

It is therefore to be seen that through the alertness of leading equipment manufacturers, the picture is ready for the producer of quick-frozen foods, from initial transport to final dispensing.

Atlantic Coast Fisheries Co. Has Fleet of These Cars

Seeger Cabinets are well insulated. This type of domestic refrigerator has made good records in conductivity tests.

For Quick Service

Self Service Stores find this type of case convenient. It is made by the Puffer-Hubbard Co.

Oreole

OREOLE refrigerated cases are being used in several stores in Springfield, Mass., to display quick frozen products which are now on sale in that city. The cases, which are equipped with Kelvinator refrigeration, are attracting interest in the experimental campaign which was inaugurated a short time ago.

This case, Model No. 2391, was specially designed by Ottenheimer Bros., Inc., Baltimore, Md., for the merchandising of the new frozen products. The panes of glass in the front of this model are spaced to give insulating efficiency. Spaces between the glass are filled with an inert gas and protected against fog or sweating between the glasses with an absorbent chemical contained in the dehydrator tubes in the center. These tubes are easily recharged through the top.

From the working side of the case, the upper display comparment is entered through three insulated hinged doors of convenient size. These doors are balanced on heavy nickeled spring hinges and close air-tight with roller type catches against compression gasket. The location of these doors is above the level of refrigeration maintained over the product displayed. This minimizes the loss of refrigeration when the doors are opened.

The three lower hinged doors open into three separate storage compartments arranged to contain the maximum number of cartons. A special device that cuts off the flow of cold air from the coil above when one or more of these lower doors is opened, prevents the bleeding or discharge of refrigeration when the case is in service. When the door is open, an automatic device shuts off the connected vent leading to the display compartment, thus preventing inrushing warm air from crowding into the display area without being retarded. The closing of the door automatically opens the shutter, which allows the warm air gathered to gradually sift into the frigid zone of the display area. All hardware is of extra heavy type to give long and trouble-proof service. Doors are constructed with ash core and jamb, additionally braced and rigid.

The coil chamber along the back and in the space under the shelves in the display compartment enables the case to be cooled with one coil located in the protected position. A special defrosting arrangement has been installed, permitting complete defrosting of the coils in a short space of time, while the case is in service, without removing the products.

Model No. 2931 has an exterior finish of porcelain and bright metal. The Oreole concealed cold illumination is a feature in this model.

Warren

A NEW line of display cases, especially designed for the showing and sale of quick frozen food products, and which completely solves the defrosting problems, will be announced soon by the Warren Company of Atlanta, Georgia, manufacturers of Warren refrigerators.

The new Warren line will be known as the "Igloo" family and advices from the factory state that they are now in production. Remarkable results in defrosting have been accomplished by the "Igloo." Where the usual defrosting processes have heretofore required many hours and often a whole day, the "Igloo" by reason of its method of refrigeration, its unique construction and the employment of the specially built Larkin dry expansion coil, is defrosted completely in 28 to 30 minutes, with a consequent drop in inside temperature of but ten degrees. In recent demonstrations of the "Igloo" the following conditions and results are typical examples: With an inside temperature of 10 degrees above zero and an outside temperature of 75 degrees above, the defrosting process required but 28 minutes, and the consequent drop of the inside temperature at the lower part of the case was only 10 degrees. Inside uniform temperatures as low as 16 degrees below zero are attained and held with the Warren "Igloo" display case.

The Warren "Igloo" line has a circulating system which keeps the coldest air falling downward across the entire case, and in no place being thrown against the glass, heavy Warren hardware, drawers which permit withdrawal of products without materially lowering inside temperature, and the use of specially built Larkin dry expansion coils.

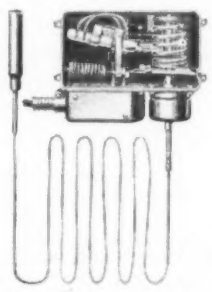
Elkins

OFFICIALS of the Elkins Refrigerator and Fixture Co., 5201 Denison Ave., Cleveland, Ohio, state that their company now has under construction a refrigerator display cabinet for quick-chilled food products. Announcement of this new case will probably be made in the near future.

Downing

DOWNING MANUFACTURING CO., Downing, Wis., has announced that it is building a new case with top display and refrigerated base for quick-frozen products. This company is also making a new porcelain clad top display refrigerator counter. These models will be available to the trade in a short time.

LOW TEMPERATURE CONTROL
for
QUICK FREEZING



No. 848 Model K-1 Mercoid Control, adjustable for temperatures between minus 30° and plus 60°. Furnished with or without ¾" union on bulb. Differential as close as 4° or may be adjusted for wider control.

FOR accurate control at the low temperatures required for quick freezing, the Mercoid control shown at the left can always be depended upon. It can be adjusted to carry any temperature from minus 30° to plus 60°. And for special work it can be furnished for even lower temperatures.

Mercoid controls operate with the well-known Mercoid switch—no exposed arc—no corrosion of contacts—and the control carries full line current, either 110 or 220 volts.

Write today for complete information on these instruments and the Arco Solenoid Valve for water-cooled units.

AMERICAN RADIATOR COMPANY
Accessories Division, Dept. MER-3
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